NETWORK WORLD
The Newsweekly of Enterprise Network Strategies
Volume 10, Number 5 An International Data Group Publication February 1, 1993

Users speak their minds about service and support

Reader survey shows up strengths, weaknesses of LAN, WAN and internetwork vendor service.

By Bob Brown
Senior Editor

The quality of service and support provided by network product vendors has improved in recent years, but suppliers still have a ways to go in meeting the service needs of users managing today's increasingly complex multivendor nets.

According to the 200 readers polled in the first *Network World*/Dataquest Worldwide Services Group "Network Service and Support Survey," vendors need to get better at supporting products in heterogeneous net environments, improve the quality of their support staffs, lower service costs and respond faster to problems (see Figure 1, page 58).

NW joined with Dataquest Worldwide Services Group to examine user views on the service and support provided by their local-area network, wide-area network and internetworking equipment vendors.

Users were also asked about new service options they would like suppliers to offer.

Surprisingly, users rate the relatively young internetwork suppliers as stronger in service and support than LAN and WAN vendors, which exhibit spotty performance in key service areas (see Figure 2, page 58).

But all vendors fall down in some places, most prominently in their ability to help users solve problems involving multiple vendors' products. Nearly 40% of users say the single biggest problem with vendor-supplied service and support is the lack of multivendor expertise.

The high cost of service is the top problem for another 15% of net professionals, many of whom are dealing with a budget squeeze. Users also complain about poorly qualified service personnel — again hitting on the absence of multivendor expertise — and poor responsiveness, whether it be returning a phone call or showing up on-site to fix a problem.

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The survey results should raise some red flags for vendors because service and support is clearly something more than just an after-purchase concern.

According to the survey, users consider service and support more important than price/performance, product features and vendor reputation when making a first-time product purchase (see Figure 4, page 59). Service becomes even more important when users switch vendors, while price/performance and product features actually decline in significance.

What's more, service represents a huge opportunity for vendors. Users report spending about 30% of their annual net-

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Rx A prescription for better service

Vendors should:

- Participate in multivendor service alliances.
- Devote more resources to staff education and user training.
- Improve response times by hiring more local support staffers and fortifying centralized help desk functions.
- Institute security safeguards on remote monitoring services.
- Use electronic information services to disseminate documentation, software upgrades and information.
- Offer pricing and packaging options to meet unique needs.

GRAPHIC BY SUSAN SLATER

MCI will overhaul frame relay service

Carrier moves in response to user concerns about performance, network management and pricing.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Faced with sluggish sales of frame relay, MCI Communications Corp. this week plans to announce a major service overhaul that addresses concerns about pricing, performance, service migration and net management.

According to Paul Weichselbaum, vice president of data product marketing at MCI, the company is changing the name of its VPDS Frame Relay service to HyperStream Frame Relay, adding distance- and usage-sensitive frame relay pricing options and upgrading trunk speeds from T-1 to T-3 (see "MCI to unveil major frame relay changes," page 54).

Boosting trunk speeds to 45M bit/sec will give MCI the flexibility to support Switched Multimegabit Data Service on the same backbone as frame relay, giving users a clean migration path to that service.

Perhaps the most important change is pricing. MCI will be the first long-distance carrier to add distance- and usage-sensitive

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AT&T preps ATM service for ComNet debut. Page 4.

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Defusing the frame relay service selection mine field. Page 45.

New Technology Assessment feature examines ATM, frame relay and SMDS. Page 51.

Windows for Workgroups put to the test. Page 55.

Brokerage decommissions aging SNA infrastructure

By Jim Duffy
Senior Editor

WEEHAWKEN, N.J. — PaineWebber, Inc., one of the nation's largest securities and financial services concerns, is cashing in its IBM Systems Network Architecture infrastructure for a TCP/IP net built with routers and frame relay links.

Out with the SNA remote front-end processors, cluster controllers, 3270 terminals and leased analog 9.6K bit/sec circuits. In with the Cisco Systems, Inc. routers, IBM Token-Ring Networks, i486 workstations running Windows and powerful local-area network servers.

The company is also installing 16 Network Equipment Technologies, Inc. (NET) IDNX/90 multiplexers equipped with NET's Frame Relay Exchange (FRX) modules, which will convert PaineWebber's T-1 backbone into a private frame relay net.

The network changes are part of a reengineering effort under which transaction-oriented applications that used to run on an IBM mainframe will now run on LAN servers along with new applications supporting investment services.

"This is a redesign that has to take us out of the 1950s and '60s [and] into a new, modern, state-of-the-art architecture," said Robert Benmosche, executive vice president and director of

(continued on page 77)

Oracle plots to conquer new worlds

By Timothy O'Brien
West Coast Bureau Chief

SAN FRANCISCO — After fighting for more than a decade to reach the top of the relational database market, Oracle Corp. is embarking on a new quest to position its software as the underpinning of a wide range of new information service offerings.

At an analyst briefing here last week, Oracle President and Chief Executive Officer Larry Ellison said that during the next two years, Oracle will establish partnerships with major companies looking to provide new services such as home shopping, personal newspapers and video mail. In addition, the company will move rapidly — in some cases, by this summer — into such new markets as electronic mail and collaborative work group computing.

"The use of enormously large servers at dramatically lower

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DCA TO UNVEIL new products, architecture. Page 4.

IBM IMPROVES OS/2 communications, database products. Page 4.

FORMER MUX chief launches new software firm. Page 4.

UB BROADENS INTERNET portfolio, signs deal with Wellfleet. Page 6.

X.400 PRODUCTS for TCP/IP, Unix environments will bow at ComNet. Page 6.

AT&T fractional T-3 pricing not much of a bargain. Page 6.

AKERS' DEPARTURE represents new opportunity. Page 6.

100M ETHERNET CAMPS square off at IEEE meet, but no decision is reached. Page 6.

NEWSPAPER
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General DataComm preps multifaceted ATM switch

Device to debut at this week's ComNet '93 can be configured as hub, router or WAN switch.

By Jim Duffy
Senior Editor

WASHINGTON — General DataComm, Inc. (GDC) this week will announce an Asynchronous Transfer Mode (ATM) switch that can be configured as a LAN hub, a high-speed backbone router or a wide-area network switch.

The device will feature a cross-point switching matrix with a nonblocking aggregate bandwidth of up to 6.4G bit/sec, said Jonathan Reeves, GDC director of systems architecture. It will sport 19 slots for Ethernet, ATM, frame relay and High-Level Data Link Control interface modules on the local side, and ATM-based T-3 links and Synchronous Optical Network (SONET) interfaces on the network side.

The switch will be available in 3.2G and 6.4G bit/sec versions, Reeves said, and will support a total of 64 ports and a maximum of 64 T-3s. The ATM ports will support speeds from 155M to 622M bit/sec.

Internet Protocol routing, token-ring and Fiber Distributed Data Interface support are also planned.

GDC licensed the cross-point switching architecture, ATM

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VTEL joins rush toward low-cost videoconferencing

Competition fierce with rivals CLI, PictureTel.

By Joanne Cummings
Senior Writer

AUSTIN, Texas — The race to bring to market a videoconferencing system for less than $20,000 heated up last week when VideoTelecom Corp. announced a $14,950 desktop unit at a meeting here for the press, analysts and its sales force.

Emphasizing the market competition, the company showed a flashy presentation featuring video clips of nuclear missiles destroying the headquarters of rival Compression Labs, Inc. (CLI) and mirrors emblazoned with the PictureTel Corp. name smashing into a thousand pieces.

The firm also used the occasion to unveil a new corporate moniker, VTEL, and outline product rollout plans for this year.

VTEL's announcement of DeskMax, a personal computer- and Windows-based videoconferencing system, comes on the heels of a similar low-cost system announced by PictureTel three weeks ago ("Room videoconferencing to entice low-end users," *NW,* Jan. 11).

These announcements, according to analysts, were timed to beat an upcoming announce-

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ComNet to host PBX debuts from AT&T, Northern Tel

By Bob Wallace
Senior Editor

WASHINGTON. D.C. — Northern Telecom, Inc. and AT&T, the top U.S. private branch exchange vendors, are expected to launch new models of their respective flagship switches at the ComNet '93 conference here this week.

Northern Telecom will unveil a high-end PBX — the Meridian 1 Option 81 — and a low-end offering — the Option 21E — while AT&T will roll out a low-end switch called the Definity Generic 3 VS.

"Northern and AT&T are shoring up their PBX lines and giving users switches with more call processing power," said Alan Sulkin, president of TEQConsult Group, a Hackensack, N.J., consultancy. "Companies can use the extra power to support networking options and serve more demanding applications."

The Option 81 uses the 32-bit Motorola, Inc. 68030 microprocessor in its DMS-SuperNode central office switch in place of the proprietary 24-bit microprocessor used in the smaller Option 21, as well as in the 51, 61 and 71.

The boost in power enables the switch to support 70,000

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Briefs

ComNet '93 to host NW 500 survey session, NREN confab. Results of a joint study sponsored by *Network World,* International Data Corp. and World Expo Corp. (the company that puts on the ComNet conference) will be released at a special ComNet session Feb. 2 at 4 p.m. The study, "Managing Network Investments in the 1990s," is based on in-depth interviews with 500 *Network World* subscribers from some of the largest companies in the U.S. It is designed to provide insight into buying patterns, the procurement processes, technology migration and organizational issues in enterprise networking.

Following the session will be another special event at 5 p.m. examining the future of the Internet/National Science Foundation (NSF) Network. The panel, hosted by *NW,* will feature Vinton Cerf of the Corporation for National Research Initiatives, Stephen Wolf of the NSF, as well as representatives from Educom and other groups.

800 users rest assured. AT&T last week announced a new version of its AT&T 800 Service Assurance Policy under which it will provide its 800 customers alternative service within five minutes of a service disruption. AT&T will reroute calls to another preset AT&T 800 number, install temporary service or route callers to a recorded announcement. The older version guaranteed the same response within 30 minutes. The plan will be available free of charge starting March 13, pending Federal Communications Commission approval.

AT&T resurrects Tariff 15. AT&T last week broke its long silence on Tariff 15 by filing a new discount deal for 800 and Software-Defined Network services for Long John Silvers, a restaurant chain. Tariff 15 allows AT&T to offer a discounted deal for a customer in response to an off-tariff, discounted deal from a competitor. AT&T said it was responding to an offer MCI Communications Corp. made to Long John Silvers. The Federal Communications Commission has been investigating the legality of Tariff 15 periodically for about four years.

BT to make a point. BT and six equipment vendors this week will demonstrate OSI-based interoperability between their network management systems using the Network Management Forum's Open Management Interoperability Point (OMNIPoint) protocol specification. The vendors — Ascom Timeplex, Inc., Fujitsu, Ltd., IBM, Network Equipment Technologies, Inc., Newbridge Networks, Inc. and Telematics International, Inc. — are also expected to announce availability of their OMNIPoint products.

NetWorth to route NetWare? Speculation was rampant among analysts last week that NetWorth, Inc. will announce next week it is licensing Novell's Multiprotocol Router software for a module in its Series 4000 intelligent hub line. The two companies declined to confirm the rumor, although they do have a joint press conference planned for Feb. 8.

Fastmac gets faster. Madge Networks, Inc. this week will announce Fastmac Plus, a new version of its Fastmac token-ring software that boosts the peak small frame throughput on any token-ring adapter card to over 30,000 frames per second, compared to 12,500 frames per second for a card running Madge's original Fastmac software. Open Data-Link Interface drivers based on Fastmac Plus will ship in the second quarter, while Microsoft Corp.'s Network Driver Interface Specification drivers will be available in the third quarter.

CONTACTS

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AT&T to announce ATM service rollout at ComNet

Unveiling could put AT&T at head of Big 3 pack.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — AT&T is scheduled to announce an Asynchronous Transfer Mode (ATM)-based service at the ComNet '93 conference here this week that builds on the company's recent ATM switch announcements.

Steve Sazegari, president of Sazegari Consulting, Ltd., a Foster City, Calif., consultancy and research firm, said the carrier will offer ATM service under its InterSpan family of data communications services, which includes the carrier's public frame relay service.

AT&T admitted it will announce the service plans here but would not provide details.

AT&T will be the second of the Big Three carriers to formally announce an ATM service rollout. Sprint Corp. detailed plans to offer ATM by year end.

"We've heard a lot from some carriers, but very little from AT&T as far as ATM is concerned," said Berge Ayvazian, a senior vice president with The Yankee Group, a Boston consulting and research firm. "The announcement could thrust AT&T to the forefront."

AT&T will be the second of the Big Three to formally announce an ATM service rollout.

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AT&T has been finalizing work on the switching platforms and interfaces as a prerequisite to field trialing an ATM service, Ayvazian said. AT&T may trial ATM service in midsummer and offer it in the fourth quarter of this year.

Rather than file a general tariff for ATM, AT&T will offer ATM service on a contractual basis, Sazegari said. This is the same approach it uses with its InterSpan frame relay offering.

Sazegari and other industry analysts said AT&T will initially base ATM services on the AT&T Network Systems GCNS-2000 ATM switch and the recently announced StrataCom, Inc. Broadband PX ATM switch ("Carriers reveal the how of ATM but not the when," *NW,* Jan. 18.)

Ayvazian said the Broadband PX will serve as an access node to an ATM backbone based on GCNS-2000 switches.

David Beering, a staff telecommunications analyst with Amoco Corp., which is a member of the ATM Forum, said "We've been waiting to see what the carriers will offer as far as ATM services and are interested in any AT&T ATM network services."

Bear, Stearns & Company,

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Network Systems reveals ATM plan, NTI partnership

By Maureen Molloy
Senior Writer

MINNEAPOLIS — Network Systems Corp. (NSC) will join the ATM frenzy later this month when it announces plans to add Asynchronous Transfer Mode support to its routers and, later, to develop a combination router/ATM switch with Northern Telecom, Inc. (NTI).

The vendor also announced last week a new platform for its 6000 series routers that will address user demands for reliability and fault tolerance in routers anchoring collapsed backbone networks.

The fault-tolerant architecture includes hot-swappable interfaces and dual load-sharing power supplies on the six-slot 400M bit/sec 6400 router and 12-slot 800M bit/sec 6800 router. The 6400 also includes a dual 400M bit/sec backup bus and two Motorola, Inc. 68030 processors.

NSC (formerly NSC/Vitalink) also added support for two-port and four-port token-ring interfaces to both routers. Previously, the routers supported Ethernet and Fiber Distributed Data Interface local-area networks only. The routers will also support a T-

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IBM preps its OS/2 for client/server

By Michael Cooney
Senior Editor

SAN JOSE, Calif. — IBM last week introduced improved OS/2 communications and database products that promise to make it easier and less expensive for users to build client/server applications and networks.

The new products, announced at the Client/Server '93 show here, include a client/server version of OS/2 Communications Manager and a more powerful OS/2 database management system with closer ties to the firm's DB2.

"We are trying to help users move to a new age of computing where they can downsize, upsize or rightsize — whatever they want," said Peter Tarrant, IBM director of client/server marketing.

At the center of the announcement is Communications Manager, the communications heart of IBM's OS/2. Originally part of OS/2 Extended Edition (EE), the product was later broken out from OS/2 along with the OS/2 Database Manager to become the Extended Services package. IBM has now taken apart that package and will sell the new Communications Manager/2 in stand-alone or client/server configurations.

Users can run Communications Manager/2 on an IBM or non-IBM server and communicate with non-OS/2 clients via a Network Basic I/O System interface. In the past, every node in the net had to run a full-blown OS/2 configuration in order to communicate with the OS/2 server. OS/2 clients will be supported in the first release, but IBM promises DOS and Windows support by the end of the year.

The server portion of the product requires a minimum of 4M bytes of memory, while the client requires about 2M bytes, according to IBM. In the past, each machine in the net needed between 6M and 8M bytes.

Communications Manager/2 contains all of the functions of the older platform, such as support for LU 6.2, 3270/5250 emulation, Advanced Peer-to-Peer Networking and Integrated Services Digital Network support, as well as a number of new features, such as increased mainframe session support.

Communications Manager/2 stand-alone and client/server configurations can communicate with as many as three main-

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New blueprint to provide cohesiveness in DCA line

By Caryn Gillooly
Senior Editor

BOSTON — Digital Communications Associates, Inc. this week is expected to unveil a new architecture that will help provide more consistency across its product line, including the new application development and SNA gateway products it will also introduce here.

According to analysts briefed by DCA, the company's Universal Communications Architecture (UCA) will serve as the blueprint to which all its personal computer-to-host communication software will adhere. UCA-compliant products will all have the same look and feel and provide consistent features no matter what desktop or host machines are involved.

Today, analysts said, DCA offers a range of products — from client-based terminal-emulation software to remote LAN connectivity offerings — with varying types of capabilities.

"With UCA, DCA is trying to establish a new identity and update its image," said Nancy Meachim, senior analyst at International Data Corp., a research firm based in Framingham, Mass.

The first product expected to be released under UCA will be a development tool designed to make it easier to build PC-based programs that access IBM 3270-based host applications using DCA's Irma WorkStation terminal-emulation software.

The tool will be based on IBM's High Level Language Application Program Interface (HLLAPI) and will be used in conjunction with other application development products. According to analysts, although HLLAPI and other APIs are designed to make application development easier, PC programmers must still learn some of the mainframe workings as well as how to tie the application in with DCA's terminal-emulation software. The new tool will eliminate

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Former NET chief launches new software company

By Bob Brown
Senior Editor

MOUNTAIN VIEW, Calif. — Bruce Smith, former chairman and chief executive officer of Network Equipment Technologies Inc., is back on the network scene floating two new buzzwords.

Smith has returned as president, CEO and founder of start-up Nomadic Systems, Inc. here, which this week will unveil a new "linkware" product serving users on the "extra-enterprise network."

Smith

Nomadic's SmartSync is Microsoft Corp. Windows-based software that enables users to automatically update data across applications running on multiple Intel Corp. 80386 or higher personal computers.

With the touch of a single key, SmartSync can bidirectionally synchronize data in spreadsheets, word processing files and other DOS or Windows files across multiple PCs. The software will eliminate the need for users to carry floppy disks from PC to

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Get in touch with the R.A.F.

The Reader Advocacy Force (R.A.F.) tackles the tough issues facing our readers — the buyers of network products and services. As consumer advocates, we want to hear about any problems you've encountered with products, service and support, or interoperability of equipment.

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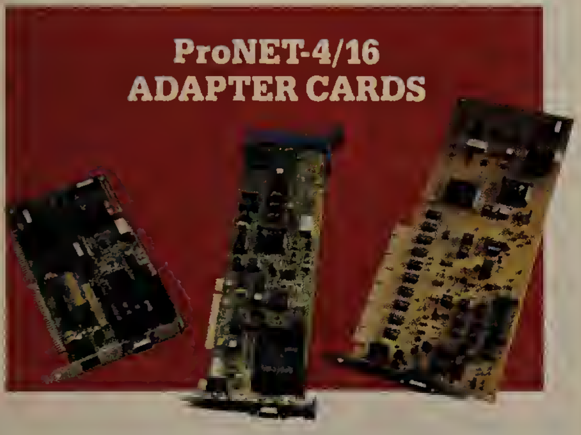

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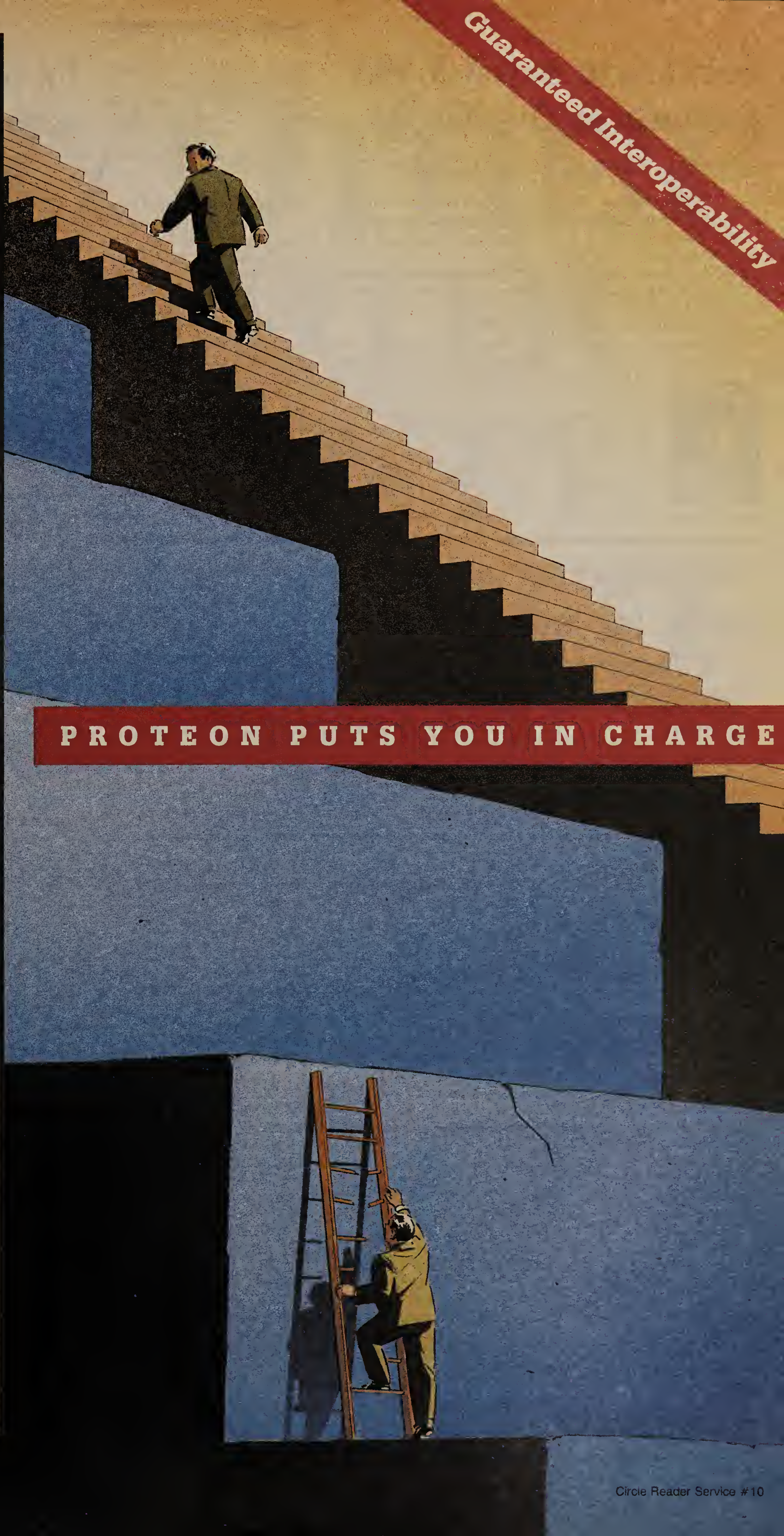

Circle Reader Service #10

OSIware to unveil X.400 products at ComNet '93

Including Unix-based gateway for E-mail systems.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — At this week's ComNet '93 show here, OSIware, Inc. will introduce an enhanced X.400 product that now works over TCP/IP nets and a new Unix-based X.400 gateway for two popular electronic mail systems.

Janie Chang

The company's new version of Messenger 400 for MS-DOS will include support for the Transmission Control Protocol/Internet Protocol so that users will be able to transmit Open Systems Interconnection X.400-based E-mail messages over both OSI and TCP/IP lower layers. In addition, OSIware will unveil Unix-based X.400 gateways for cc:Mail and Microsoft Mail.

OSIware has added FTP Software, Inc.'s TCP/IP stack to Messenger 400, its MS-DOS-based X.400 product, so that MS-DOS systems can use a Unix-based machine connected to a high-speed TCP/IP net to act as a Message Transfer Agent (MTA). MTAs route messages in X.400 networks.

"Messaging means connecting, and sometimes this means providing more than what the standard asks for, such as supporting TCP/IP networks or asynchronous dial-up lines," said Janie Chang, product manager at OSIware in Vancouver.

More bang for the buck

The Messenger 400 product is based on the 1998 X.400 standard, but it adds features such as least-cost routing, scheduling, billing and statistics collection, which go beyond the current standard.

Jeanne Abmayr, product manager at FTP, called OSIware's decision to support the Internet Engineering Task Force standard RFC 1006 for supporting X.400 over TCP/IP a "pragmatic marriage of technologies" that recognized the need to use existing network infrastructures.

Messenger 400 for MS-DOS

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100M Ethernet group lays course for future standard

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — The battle is engaged.

The two main camps striving to dominate development of a standard for 100M bit/sec Ethernet faced off at an IEEE meeting here last week, armed with competing proposals and rival bands of supporters.

But the IEEE's 802.3 Higher Speed Study Group did not choose sides, nor did it make any decisions on the big issues — which of the competing transmission schemes to use and whether to keep Ethernet's media access control (MAC) layer protocol intact. The committee did, however, lay out a list of objectives it plans to achieve in developing a higher speed Ethernet.

This meeting was the first opportunity for the two major camps on the issue to square off formally. Hewlett-Packard Co. and AT&T Microelectronics led one group whose 100M bit/sec Ethernet plan calls for a change in the MAC protocol, while the 3Com Corp.-SynOptics Commu-

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AT&T rates for fractional T-3 released

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Pricing revealed last week by AT&T for its fractional T-3 service indicates that it will cost only slightly less than an equivalent number of the carrier's T-1 lines.

For example, a 300-mile 6.2M bit/sec interoffice channel would cost $13,600 per month, while the equivalent bandwidth — four T-1s — would cost $14,200.

"Since there isn't a sizable savings over multiple T-1s, I can't see users flocking to these services," said David Durgee, a vice president with The Aries Group/MPSG, a Rockville, Md., tariff analysis and network design firm. "AT&T is going to have to make these new services more attractive."

AT&T's Accunet Fractional T45 service, announced in November, will be offered at speeds of 4.6M, 6.2M, 7.7M and 10.8M bit/sec and is scheduled to be available in 104 U.S. cities on Feb. 8.

AT&T will charge users a monthly fixed charge plus a monthly per-mile fee for the service. The 4.6M bit/sec service will cost $7,350 per month plus $10.40 per mile, while the 6.2M bit/sec offering is priced at $9,550 per month plus $13.50 per mile.

Companies that use the 7.7M bit/sec service will pay a fixed monthly fee of $11,700 plus $16.60 per mile, while the monthly charge for the 10.8M bit/sec offering is $15,700 plus $22.35 per mile.

> "AT&T is going to have to make these new services more attractive," Durgee said.
>
> ▲▲▲

By comparison, AT&T charges $2,500 per month plus $3.50 per mile for its Accunet T1.5 service. Its T-3 service, Accunet T45, costs $16,000 per month plus $45 per mile.

Accunet Fractional T45 will be covered under AT&T's MultiService Volume Pricing Plan (MSVPP) to help users reduce costs. Under MSVPP, users can obtain discounts for fractional T-3 usage alone or combine usage of multiple services, such as AT&T's fractional T-1, Dataphone Digital Service, T-1 and T-3 services.

For example, a firm that signs a one-year deal and commits to spending $5,000 a month on one or more of the covered services would receive a 23% discount, while a company that signs a five-year contract and commits to spending $1 million a month would receive a 57% discount.

AT&T said that GE Aircraft Engine in Evendale, Ohio, will test the new service, which will also be demonstrated at the ComNet '93 conference in Washington, D.C. this week.

The carrier is awaiting approval from the Federal Communications Commission before it can offer the new service.

UB bolsters internet line with router cards and deal

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — Ungermann-Bass, Inc. will broaden its internetworking portfolio with new local and remote bridge/router modules for its intelligent hub and a deal to private-label Wellfleet Communications, Inc.'s line of bridge/routers — including the top-of-the-line Backbone Concentrator Node.

The local bridge/router modules for UB's Access/One intelligent hub, which will be announced at ComNet '93 here, were jointly developed with Advanced Computer Communications (ACC). They include the Access/One Plus Multiport Ethernet Bridge/Router and the Access/One Plus Fiber Distributed Data Interface Bridge/Router, as well as the Access/One Local Token Ring Bridge.

They use UB's PlusBus technology, a 320M bit/sec Reduced Instruction Set Computing switching backplane that allows the hub to forge nonblocking switched paths between end stations.

The four-port Ethernet version is designed to support more

(continued on page 21)

Akers' departure may lead to new focus for IBM

By Bob Brown
Senior Editor

NEW YORK — Last week's resignation of IBM Chairman John Akers as CEO offers the troubled company an opportunity for a fresh start — one officials in the network industry said should be exploited to move more aggressively into networked computing.

Akers announced he would step down as chief executive officer at a meeting of IBM's board, which hopes to choose a new CEO by spring. Akers, whose decision to resign was an about-face from earlier pledges to turn IBM around, faced mounting criticism for his inability to move IBM away from its mainframe-centric view to fully embrace networking and desktop computing.

"There hasn't been much new in networking from IBM in a long time, probably not since Token Ring," said Bruce Smith, president and CEO of Mountain View, Calif., start-up Nomadic Systems, Inc. and former chairman and CEO of Network Equipment Technologies, Inc., which has a major alliance with IBM.

Smith said IBM must change its perspective on computing to "individual-centric rather than host-centric" — including paying more attention to meeting the needs of remote users and others.

IBM has great network technology, but much of it has been lost behind muddled marketing efforts, said Ed Snyder, president and chief executive at ProTools, Inc., a Beaverton, Ore., network monitoring tool company that sells IBM OS/2-based products. IBM also needs to form partnerships with firms that can provide key pieces of technology.

"If IBM continues to offer just a smorgasbord of its own network products, users will wind up with lots of stale food," he said.

Patrick Courtin, president and CEO of Proteon, Inc., a Westborough, Mass., internetworking and LAN equipment vendor, said IBM's slow movement in the network arena has helped companies such as Proteon grow.

Courtin cited token ring over unshielded twisted-pair wiring as an example. IBM initially denied the possibility of running token ring over unshielded twisted pair, then reversed its stance two years later — after other vendors had hit the ground running.

Craig Benson, chairman and

(continued on page 78)

Corrections: In the Internetworks graphic that ran in the Jan. 18 issue, the 1992 revenue figure for Cabletron Systems, Inc. should have been $377.4 million.

In the LAN World article "Architecture not the sole ATM question" (*NW,* Jan. 11), it was incorrectly reported that Fore Systems, Inc. offers an adapter for a Scientific Glass and Instruments, Inc. workstation. Fore Systems provides adapters for Silicon Graphics, Inc. workstations.

The page 2 Briefs of the Jan. 18 issue incorrectly stated that Ameritech is conducting a wireless Centrex trial with the University of Chicago. The trial is with the University of Illinois-Chicago.

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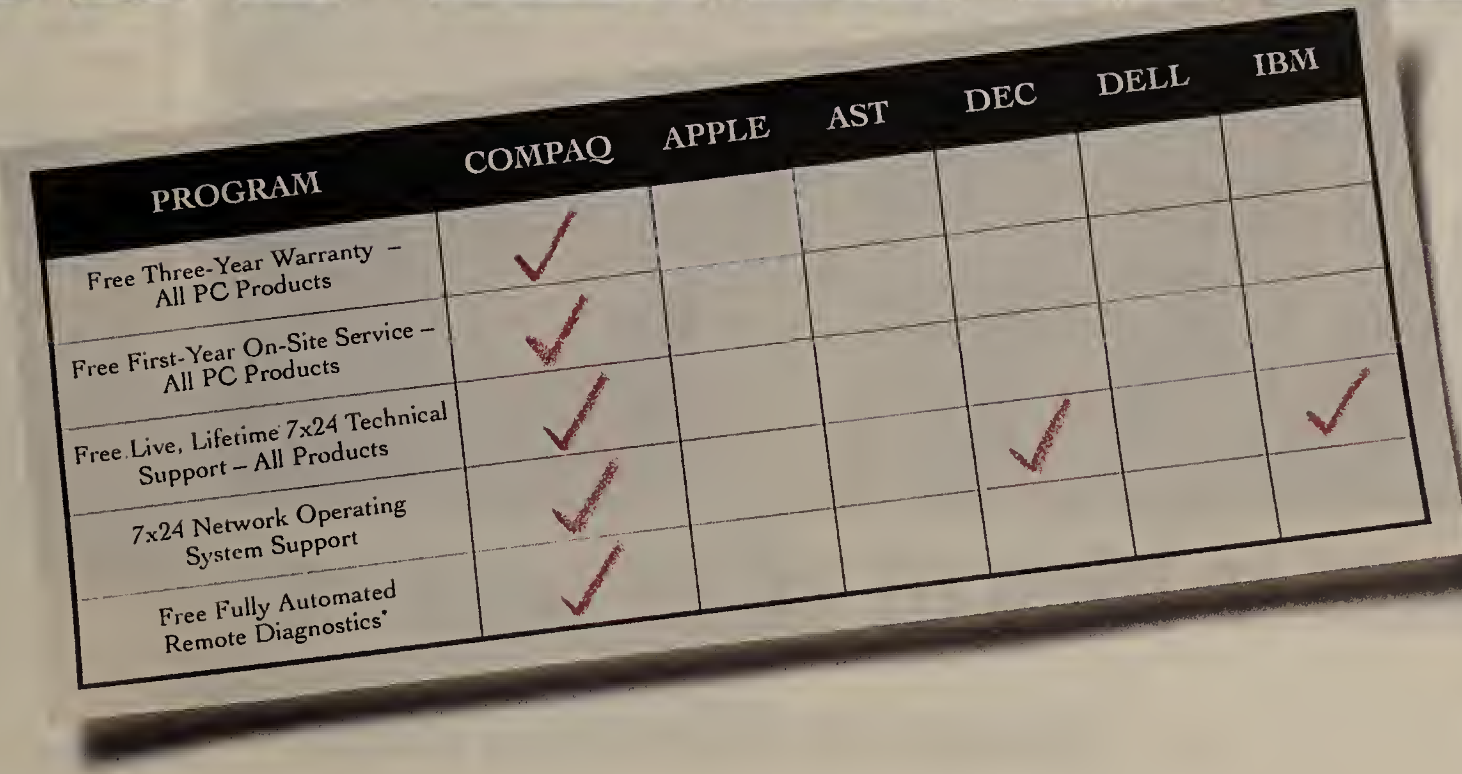

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Circle Reader Service #3

General DataComm preps ATM switch

continued from page 2

modules and chassis from Netcomm, Ltd., a British maker of packet- and cell-based networking products. GDC will add T-1, T-3, SONET and other modules to the Netcomm switch.

The switch will be shown at INTEROP 93 Spring here in March and is scheduled for general availability this summer.

As a local-area network hub, the switch will compete with Adaptive Corp.'s 1.2G bit/sec ATMX switch and Fore Systems, Inc.'s ASX-100, a 2.5G bit/sec device, analysts said.

As a wide-area premise switch, the GDC system will butt heads with Newbridge Networks, Inc.'s MainSteet 36150 SONET multiplexer, which weighs in at 10G bit/sec, and StrataCom, Inc.'s new Broadband-PX (BPX), which packs a 9.6G bit/sec punch.

Analysts are leery, however, about GDC's ability to compete with StrataCom's BPX.

"The only reason the BPX is sellable is because of the IPX affinity in the existing frame relay networks," said Thomas Nolle, president of CIMI Corp., a Voorhees, N.J., telecommunications consultancy.

According to Reeves, users will be able to configure GDC's switch as a LAN hub, a gateway to public ATM services or as a private wide-area ATM network switch.

"We're positioning it midway between where companies like Fore Systems and Adaptive have targeted their products and where large central office switches will be located," he said.

The biggest opportunity for the switch is as a "hub of hubs," he said. "What we can provide is a very high bandwidth switching system that will enable LAN hubs with ATM interfaces to communicate with one another." The GDC switch will also accept native frame relay, X.25, Systems Network Architecture, isochronous voice and video data streams, and aggregates of T-1 links, whereas competitive ATM hubs cannot, Reeves claims.

"You can bring those streams directly into the ATM switch," Reeves said. "Most other vendors require that you go through another box, which provides the adaptation, and then connect that box to the switch."

The switch will also feature congestion management and priority queuing capabilities, he said. Data transmission will be monitored on a per-virtual-circuit basis, he added, and guaranteed throughput will be provided for delay-sensitive traffic such as voice and video.

GDC will also announce the Broadband Transfer Module (BTM) for its Megamux T-1 multiplexer. The BTM will package data in 53-byte cells and forward them to the new ATM switch.

Pricing will be disclosed at INTEROP.

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Circle Reader Service #27

New blueprint to provide cohesiveness

continued from page 4

those complexities.

"This is basically a module that sits in between DCA's products and another vendor's application development product," said Cindy Santisario, senior analyst at IDC. "They've already written all the hooks [into the existing DCA products]. They've done half the job."

The first release of the tool is expected to be compatible with Microsoft Corp.'s Visual Basic application development tool, IDC's Meachim said, and DCA plans to ultimately make the product compatible with a variety of tools.

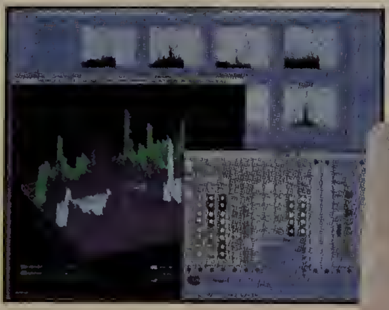
DCA is expected to bring out Irma WorkStation for OS/2 and Irma WorkStation for NT.

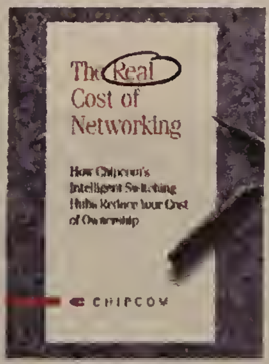
▲▲▲

DCA is also expected to bring out Irma WorkStation for OS/2 and Irma WorkStation for NT — new versions of the company's existing 3270 terminal-emulation software — which will let users of OS/2 and Microsoft Windows NT-based machines access host applications. DCA's current product set only supports DOS- and Windows-based machines.

Finally, DCA is expected to announce plans to resell Novell, Inc.'s NetWare-to-host gateway software, dubbed NetWare for Systems Application Architecture.

DCA is expected to make its application development product available in March for under $1,000. More specific pricing was not available. The new Irma products are expected to be available in April. Pricing on these products was not available.




The Real Cost of Networking
How Chipcom's Intelligent Switching Hubs Reduce Your Cost of Ownership
CHIPCOM

While the others play follow-the-leader, we thought you'd like to know who they're following.

Funny thing. Seems like every time we talk to a potential customer about our ONline intelligent switching hub, the competition immediately starts discounting the price of their units.

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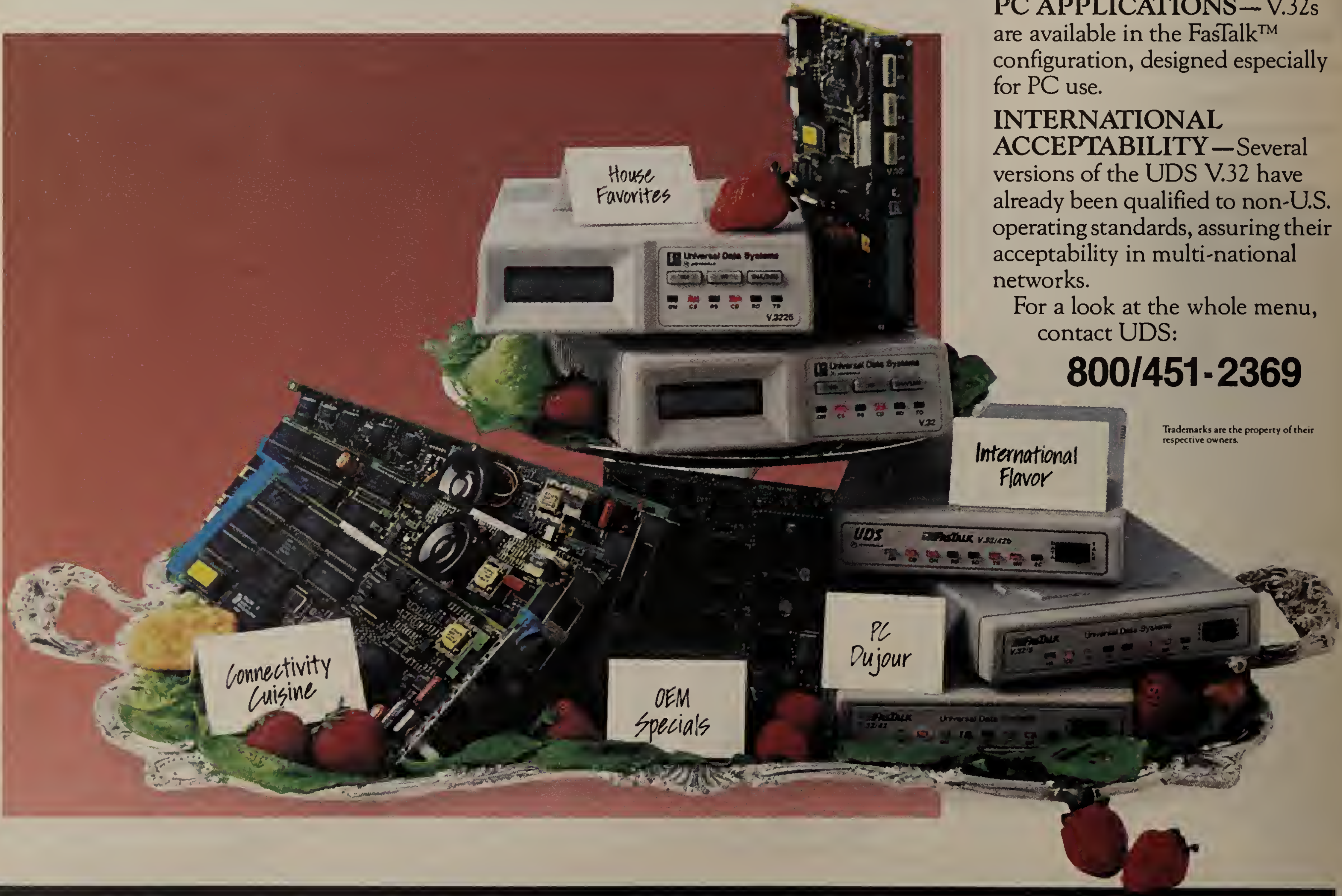

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Circle Reader Service #31

DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

> Claims that SNMP management systems can govern enterprisewide networks are "a travesty of catastrophic proportions."
>
> **John Reis**
> President
> MAXM Systems Corp.
> Vienna, Va.

Data Packets

At ComNet '93 in Washington, D.C. this week, **Micom Communications Corp.** of Simi Valley, Calif., will announce a new data service unit/channel service unit (DSU/CSU) that transmits data, voice, LAN and fax traffic over a single low-speed digital line.

The FrontRunner MR-2 connects to digital leased lines at 2,400 to 64K bit/sec. It works with Micom's Marathon Data/Voice Network Server and NetRunner Data/Voice Internetwork Node, two products that integrate data, voice, local-area network and facsimile traffic through multiplexing and bridging, respectively.

FrontRunner MR-2 is equipped with RS-232, V.35 and EIA-530 interfaces.

The DSU/CSU costs $695 and will be available in March.

Also at ComNet, **RADCOM, Ltd.** of Mahwah, N.J., will unveil a portable pocket-sized wide-area network analzyer.

The RC-100, which weighs 4 pounds, is a Reduced Instruction Set Computing-based device that allows users to locate the source and destination of errors as well as monitor traffic.

The RC-100 is priced at $9,000 and is available now.

ACD looks to unravel some management mysteries

Two new products track moves, isolate faults.

By Jim Duffy
Senior Editor

WASHINGTON, D.C. — At the ComNet '93 show here this week, Applied Computing Devices, Inc. (ACD) will seek to unravel the mysteries of tracking moves, adds and changes, and pinpointing faults in a large distributed network.

The Terre Haute, Ind., company will roll out two products — Provisioner and Correlator — that run on its Unix-based Network Knowledge System management platform. Provisioner enables network managers to log and display on a topological map new network devices, as well as track devices that are moved. Correlator isolates the root cause of a network fault that triggers multiple alarms, thereby relieving the manager of scrolling through a sea of event messages to locate the problem.

Provisioner is an application that runs on ACD's Unix-based Network Knowledge System management platform. When adding or relocating a network device, net managers can select an icon that depicts the device from Provisioner's graphic icon library and then place it on a topological network map. Managers enter device attribute information, such as site identification and number of configured ports, on the Network Knowledge System screen.

After the attribute information is logged, Provisioner then "draws" the physical and logical connections to the newly added or moved network device on each level of the net map. It does this by gleaning configuration information, logged in a database when the network was initially built, about other devices at the site and their relationship to the

(continued on page 15)

Data Race to release line of data/voice/fax muxes

By Jim Duffy
Senior Editor

WASHINGTON — Data Race, Inc. will unveil at the ComNet '93 show here this week a line of data/voice/fax multiplexers that, among other features, offer 8K bit/sec voice and fax channels.

The new Mach DS plus includes models that have fixed asynchronous, selectable asynchronous/synchronous and wide-area ports, and those that let users mix and match modules. All models, however, provide multiple 8K bit/sec channels for integrating voice and facsimile traffic, a feature that is intended to shave communications costs.

The Mach DS plus line is offered in eight-, 16-, 32- and 64-port models. The eight- and 16-port models house the fixed ports, while the 32- and 64-port versions feature slots for housing various modules.

On the local-area network side, the eight-port version offers four asynchronous and four selectable asynchronous/synchronous ports, each operating at 38.4K bit/sec. On the wide-area network side, it features three RS-232 or V.35 interfaces operating at up to 64K bit/sec and supporting four voice/fax channels.

The 16-port configuration offers eight asynchronous and eight selectable ports on the local side and six 64K bit/sec RS-232 and V.35 ports that can support a total of eight voice/fax channels.

The 32-port model is a five-slot chassis housing any combination of five asynchronous or selectable cards, or 64K bit/sec WAN cards. The Mach DS plus 64 is a 64-port, 10-slot chassis housing any combination of 10 LAN or WAN cards.

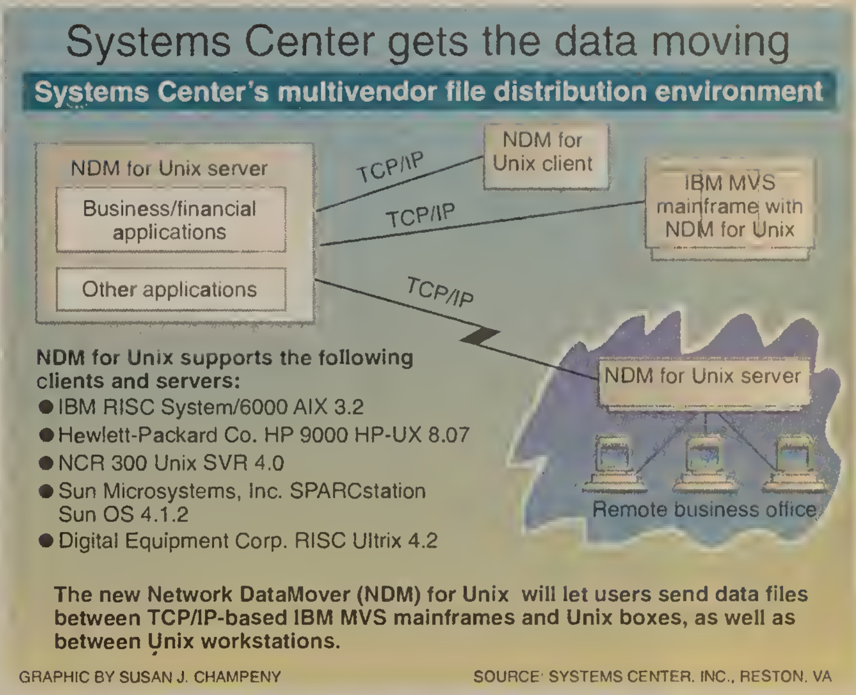
The Mach DS plus' voice modules achieve toll-quality voice using 8K bit/sec per channel, instead of the 16K bit/sec used in the Mach DS mux, the predecessor to the Mach DS plus, Data Race said. Each voice/fax module supports two voice/fax channels.

The 32- and 64-port models can be configured with any number of integrated voice/fax cards, according to the company.

The asynchronous and select-

(continued on page 15)

Systems Center gets the data moving


Systems Center's multivendor file distribution environment
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IBM MVS mainframe with NDM for Unix
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NDM for Unix supports the following clients and servers:
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- Hewlett-Packard Co. HP 9000 HP-UX 8.07
- NCR 300 Unix SVR 4.0
- Sun Microsystems, Inc. SPARCstation Sun OS 4.1.2
- Digital Equipment Corp. RISC Ultrix 4.2

The new Network DataMover (NDM) for Unix will let users send data files between TCP/IP-based IBM MVS mainframes and Unix boxes, as well as between Unix workstations.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: SYSTEMS CENTER, INC., RESTON, VA

Firm automates Unix TCP/IP file transfer

Systems Center's NDM for Unix enables users to exchange data between multiple applications.

By Michael Cooney
Senior Editor

RESTON, Va. — Systems Center, Inc. last week announced Network DataMover (NDM) for Unix software that lets Unix users on TCP/IP nets define, schedule and automate data transfers between applications running on different vendors' machines.

NDM for Unix resides on Unix clients and servers from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. A version also runs on IBM MVS mainframes as a client or server.

The product helps users improve productivity and better manage growing distributed networks by automating and streamlining many redundant tasks. NDM for Unix will also help users looking to distribute applications to various Unix machines across an enterprise more easily let those applications share data with a centralized Unix server or mainframe, analysts said.

Built-in automation features let users prioritize, define and schedule data transfers between the Unix platforms and between Unix machines and the IBM mainframe. The software also provides checkpoint restart features that let the system automatically resend data from the point of failure if a communications link or node fails during the file transfer, obviating the need to resend the entire file.

One of the software's key features is an NDM application program interface that lets users build applications that can automatically accept and integrate data transfers, said Rick Camp, director of the NDM product line.

"A retail company can write a central business/financial application that can accept all of the receipts from its remote office operations overnight," he said.

Existing Transmission Control Protocol/Internet Protocol file-transfer products, such as those that use the File Transfer Protocol (FTP), only transfer data into an awaiting queue, forcing the user to manually enter the information into the appropriate application, Camp said. Such programs also do not include the automation features found in NDM for Unix.

"Without additional features such as unattended operations, support for multiple platforms, error recovery and integration with specific related applications, bare-bones commodity file-transfer programs like FTP are inadequate for many business applications," he said.

Analysts gave NDM for Unix an early thumbs-up but said they would like to see the product in action.

"The key for this product will be how easily users can integrate the file transfers with the applications, and that isn't clear yet,"

(continued on page 15)

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"Doing your own network integration? Time-out!"

Ralph Ungermann

Ralph Ungermann
President, CEO

Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Circle Reader Service #29

See us at ComNet '93, Booth #270

Racal-Datacom extends high-speed access with new products, releases

By Michael Cooney
Senior Editor

SUNRISE, Fla. — Racal-Datacom, Inc. last week rolled out new products and enhancements that widen the company's high-speed networking and network management offerings.

The announcements include an upgrade of the Racal Communications Processor-Packet Switching Module (RCP-PSM) frame relay switch, new automation features for the Racal Management System (RMS) Network Control Unit and a single-port version of the company's Excalibur multiplexer.

The RCP-PSM is a frame relay switch with integrated packet assembler/disassembler and line concentration features that is designed to bring a variety of data communications devices, such as terminals, bridges and routers, onto high-speed corporate backbones.

The enhanced version of the RCP-PSM support X.25 public nets and the Shortest Path First (SPF) adaptive routing capability.

"The new version gives users more flexibility in migrating from X.25 to frame relay," said Charles Jimenez, product-line manager for the switch. "SPF picks the best route and allows local-area traffic to get across the WAN as fast as possible."

The RCP-PSM frame relay switch supports asynchronous, X.25, Systems Network Architecture/Synchronous Data Link Control or frame relay protocols on the local side and RS-232, V.35, RS-422 and X.21 interfaces. The switch can house as many as five Reduced Instruction Set Computing-based I/O cards, each supporting up to eight ports, for a maximum configuration of 40 ports. The switch also can be configured to support as few as four ports.

A port can support speeds up to 2.048M bit/sec, but only a maximum of two ports per card can be set at that speed, giving users up to 10 2.048M bit/sec ports. The ports can also be configured to support speeds as low as 50 bit/sec.

The RCP-PSM concentrator/packet switch will be available in the first quarter starting at $8,000. Racal-Datacom had announced, but not shipped, an earlier version of the device.

> "The Scripting features can handle problems much faster than an operator could," said Allan Scharf, senior product manager for RMS.
>
> ▲▲▲

Following the script

In addition to the RCP-PSM enhancements, the firm added Scripting commands to its RMS Network Control Unit software that let users automate responses to network problems and automatically handle such activities as dial backup testing.

The RMS software is an integrated element management platform for controlling modems, muxes, bridges and routers from Racal-Datacom.

The RMS unit monitors LAN/WAN segments and detects a line or device failure, while the new Scripting automation features can kick off a restart command or perform automatic net backup procedures.

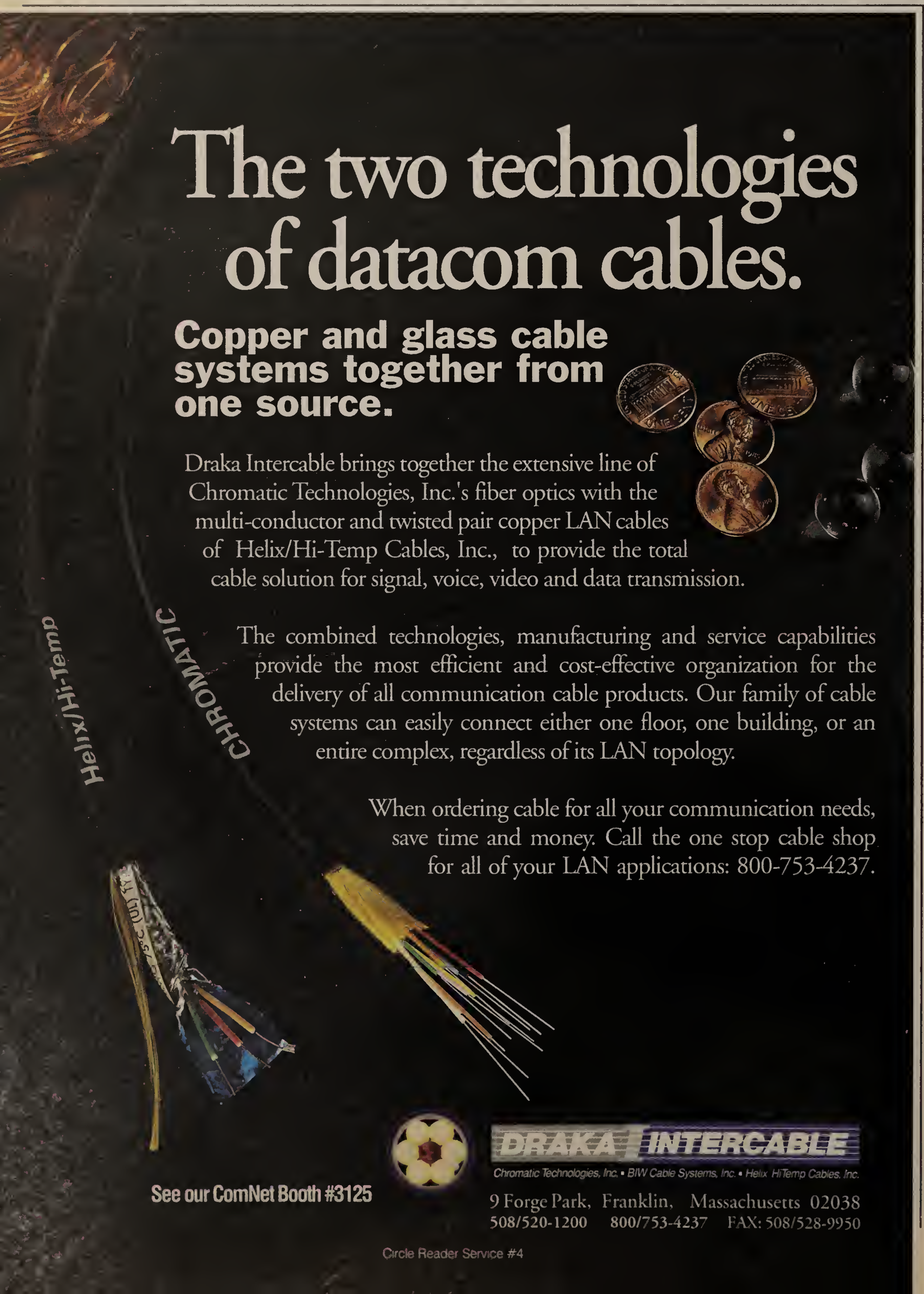
"The Scripting features can handle problems much faster than an operator could," said Allan Scharf, senior product manager for RMS.

Prices for the Scripting support vary from $2,000 to $4,000, depending on the number of scripts users need.

The company also announced a single-port version of its Excalibur Single-Ended T-1 mux. The single-port mux is designed to reduce user line costs, concentrating data from 24 lines onto a single or fractional T-1 link.

The mux supports synchronous channel speeds of 1,200 to 64K bit/sec or asynchronous speeds from 75 to 19.2K bit/sec. Excaliber also comes in a multiport/multidrop version.

One Single-Ended T-1 with an RS-232 adapter costs $1,800. With a V.35 adapter, the unit costs $1,850. Both are available now. ☒



The two technologies of datacom cables.

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Circle Reader Service #4

ACD looks to unravel mgmt. mysteries

continued from page 11

new device. For example, if a router is relocated to a local-area network at a new site, Provisioner will draw a connection between a server on that LAN and the router, and from the relocated router to other routers.

Provisioner then updates the Network Knowledge System configuration database and other pertinent databases with the new configuration information in real time. It also creates the linkages between the device and the ACD application, called MegArray, that maintains a real-time status of the net so alarms can be displayed.

Any change to the device configuration is charted in the configuration database by Provisioner in real time and replicated to all affected databases, ACD said.

"All those linkages are automatically built," said Steve Barnhart, ACD vice president of marketing and sales. "If they're not automatically built, the human has to do it. Our argument is that this [information] changes so fast that you can't hire enough people to do it."

Provisioner also allows network managers to extract configuration information from non-ACD management systems using library routines that allow managers to add database command interface languages, such as SQL, and non-ACD management protocols. Once the information is extracted, it is stored in the Network Knowledge System configuration database and all network views on the topological map — such as state, region, city and building — are automatically updated.

Correlator, meanwhile, is a rules-based application that analyzes patterns to isolate the root cause of a fault. Correlator mimics the thought processes of human network managers, ACD said.

"We've taken that human cognitive process, modeled it and put it inside our own database," said Rick Fulwiler, ACD manager of strategic product engineering. "The system is only as good as the human can think about a problem."

When a fault is isolated, Correlator changes the graphic icons on the topological network map to reflect events that preceded the fault. It also creates on-screen messages that indentify the problem and its location, and textual messages that detail its cause.

Provisioner and Correlator are available now. Provisioner is priced from $7,500 to $27,500, and Correlator is priced from $5,000 to $15,000, depending on the size of the processor.

Data Race to release data/voice/fax muxes

continued from page 11

able port speed of 38.4K bit/sec is twice the rate of 19.2K bit/sec supported by the Mach DS mux, an enhancement intended to meet the needs of Unix workstation users who perform graphical screen updating, Data Race said.

The ports are software programmable for either asynchronous or synchronous data transmission to accommodate users in multivendor environments that may need to connect to mainframes, terminal servers, front-end processors or bridges. The synchronous settings support Synchronous Data Link Control and High-Level Data Link Control protocols with dynamic bandwidth allocation, so that only the bandwidth needed by the traffic is used.

For other protocols, the ports have fixed bandwidth allocation.

Software changes for the Mach DS plus can be downloaded from a personal computer diskette, Data Race said.

Pricing for the Mach DS plus will be announced this week.

Firm automates Unix TCP/IP file transfer

continued from page 11

said Charles Robbins, director of communications research with the Aberdeen Group, Inc., a Boston consultancy. "For many users, it isn't enough just to do file transfers. Integrating the data with applications is a clear user need."

Robbins said NDM for Unix is positioned as a high-end file-transfer product, not a low-priced commodity product. "Users can get some FTP implementations for $1,000, but they don't do all of the functions NDM for Unix will do," he said.

NDM for Unix joins the firm's other NDM products for the Application System/400, VM, VSE, DEC VMS and Tandem Computer, Inc. Safeguard platforms. The NDM for Unix platform cannot transfer files between the other NDM products, but Camp indicated the company was looking into that possibility for the future.

NDM for Unix will be available March 31. Server software will cost $1,500 to $18,000, depending on the server size. Client software will cost $375 to $4,500.

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LAN WORLD

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Worth Noting

> "StreetTalk is a robust, proven technology, and all the exposure Novell will give directory services in the coming months [with the release of NetWare 4.0] should have a positive impact on Banyan."
>
> "Burton Group News Analysis"
> The Burton Group
> Salt Lake City

Netnotes

XTree Co. last week began shipping XTree Tools for Networks, Novell Edition, a suite of integrated LAN management tools.

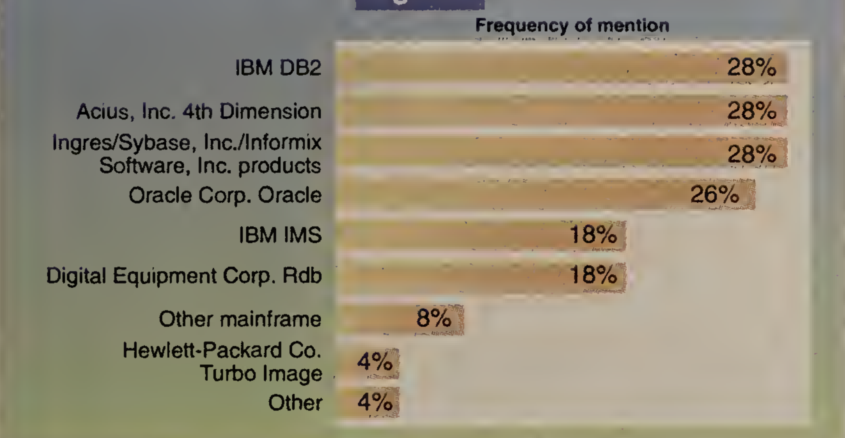
A NetWare Loadable Module (NLM), XTree Tools for Networks was designed to 'demystify' and simplify local-area network management by providing information about the network and its performance while offering advice and solutions for solving existing network problems and avoiding new ones.

A common interface provides access to seven modules: a configuration manager, which replaces NetWare's SYSCON utility; a server monitor; a workstation monitor; a configuration backup and restore; QuikStat, a testing routine that notifies administrators when results deviate from user-set parameters; WatchLAN, a workstation-based runtime testing and event notification program; and NetTrack, a statistics utility that covers file server performance.

Available through resellers and distributors, XTree Tools for Networks costs $695 for the first server and $395 for each additional server. Corporate site licenses are available directly from the company. ◻

Corporate databases accessed by Macs

Figure 1



GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: ABERDEEN GROUP, INC., BOSTON

Macs become integral part of corporate infrastructure

Study says they are more networked than PCs.

By Fredric Paul
Senior Editor

BOSTON — Belying their image as mere toys for the design department, Macintoshes are more highly networked to corporate databases than are PCs in equivalent companies, according to a survey published by Aberdeen Group, Inc., a consulting and market research organization here.

The users surveyed for the report "Apple Computer: The Corporate Users Speak!" said virtually all of their Macintoshes are networked.

The typical Macintosh user is connected to one mainframe, two minicomputers — usually Digital Equipment Corp. VAXes — a handful of peers and two databases.

Networks used to support Macintoshes range from AppleTalk (mentioned by 90% of the respondents) to Ethernet (78%) and token ring (30%). Almost half of the respondents support Macintoshes using Novell, Inc. NetWare, while Systems Network Architecture and DECnet (including Pathworks) also play significant roles.

The data indicates that Macintoshes "are becoming part of the overall computing infrastructure rather than isolated work group clusters or departmental systems," the Aberdeen Group said.

The trend was most clear in

(continued on page L8)

System gives Unix users mainframe-class storage

By Caryn Gillooly
Senior Editor

LOUISVILLE, Colo. — Storage Technology Corp., traditionally a provider of mainframe storage products, this week is expected to introduce a local-area network, Unix-based storage management system.

The new product, called NearNet, is a hardware/software system that will let Unix workstations store information on the company's existing mainframe-based 4400 Automated Cartridge System, also known as the library.

"Our claim to fame has been the library attached to mainframes, but we were finding that more and more customers needed to attach the library to their network servers," said Don Kleinschnitz, director of software solutions for Storage Technology, based here.

According to Ryal Poppa, chairman, president and chief executive officer at Storage Technology, "We have attached the library to more than 15 vendor platforms, but NearNet is the first product to extend the reach of the library to the desktop."

The NearNet system has three primary components: a Sun Microsystems, Inc. workstation, dubbed the NearNet 7990 Storage Management Unit (SMU); server

(continued on page L10)

LAN techies discuss product strategies

Chief technical specialists put marketing rhetoric aside and delve into wide range of product issues.

Users often lament that they might be able to get at the truth about vendor product strategies if they could sweep aside the marketing muck and hunker down with vendors' top technical minds.

They got that chance at the Networld 93 Boston show last month.

Network World *Features Editor Charles Bruno and Steve Basile, manager of engineering services at integration specialist ERI, Inc., assembled top technical specialists from Banyan Systems, Inc., IBM, Microsoft Corp. and Novell, Inc.*

Vendors were represented by Bob Nuber, director of product strategy for Banyan; John Wilson, chief technical lead for IBM LAN Systems; Rick Segal, technical evangelist at Microsoft; and Drew Major, chief architect at Novell.

Bruno: John, every network operating system offers basic sets of services — file, print and sometimes electronic mail. What differentiates IBM's product from others on the market?

Wilson: I can think of a half-dozen things we're doing that, if we do them well, will differentiate us from the competition. The first is the breadth and integration of the network operating system facilities with the operating system.

At last Fall's Comdex, we introduced the Workplace family of operating systems, which covers OS/2, AIX, DOS and, later, the micro kernel operating systems. And now we're developing a family of integrated facilities for those operating systems that will span the whole range of customer requirements, from the peer LAN through the work group, up to the integrated enterprise.

The thing that characterizes these facilities as a family will be a common set of [application program interfaces], application development tools and, of course, interoperability between those network operating systems.

Secondly, one of the things that will differentiate us is openness. And that might seem a little strange coming from IBM, but basically we made a strong commitment to openness, and we're serious about it.

In fact, at this show, we have a [Distributed Computing Environment] booth where we talk about our support for DCE across that family of operating systems. And that will grow into the family through the micro kernel.

DCE will form the foundation technology for the work group servers, and we will provide advanced functions on top of that. For example, the on-line transaction processing we're concurrently announcing with DCE support will form a robust mechanism for transaction processing across a LAN operating system.

> "We made a strong commitment to openness, and we're serious about it."

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Beyond DCE, we'll also be using the [Open Software Foundation, Inc.'s Distributed Management Environment] for system management.

We support many X/Open [Company, Ltd.] and [Portable Operating System Interface] APIs through the DCE facilities and beyond those.

Our object model, for example, is going to be [Object Management Group Common Object Request Broker Architecture]-compliant, and we'll introduce a distributed form of the object model that is CORBA-compliant with the DCE facilities.

The object facilities will differentiate us over time, where based on the object model, we'll be providing distributed objects on top of a Sockets interface and on top of the DCE [remote procedure call] and security facilities.

(continued on page L2)

LAN techies discuss strategies

continued from page L1

And we will also use the distributed object mechanisms as the foundation for system management across the network. [Therefore], with heterogeneous distributed object support, you can treat system-managed objects as objects in the enterprise network and access them through the distributed object mechanism.

"I'm not a big fan of believing that everything connects to everything."

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Bruno: Rick, how does Microsoft approach it?

Segal: Well, Microsoft has taken a somewhat different approach. First we tried the frontal assault, where we waved our hands up and down saying we're better and faster than Novell. That was a bad plan, and we learned a very valuable lesson.

So we went back and did a lot of work on trying to get the LAN Manager product up to what is considered a very good, stable environment to run an enterprise on.

Then we tried to set up a set of APIs that are standard across the enterprise.

As we expand up to the Windows NT arena and do things like Windows for Workgroups, we are trying to keep the APIs as standard as we can to allow independent software vendors and corporate developers to leverage their investment and have applications scale up and down the enterprise as appropriate.

In this way, if they're going to work with a NOS on a [Reduced Instruction Set Computing] system or work with a modular Windows, things would essentially be the same.

You want to make it fast and robust, and you want to have kitchen-sink features in there to do all kinds of things. But I think Microsoft would like to believe that its strength is that it is focused very heavily on a single Windows front end from a presentation perspective and, underneath, a scalable architecture supporting different platforms. So that would be the differentiating factor for us.

Bruno: Bob, how does Banyan approach it?

Nuber: The key differentiator for Banyan's approach to networking has really been our focus solely on the problems of building enterprise networks — making it easy for people to build, to manage and really utilize enterprise networks within their organization.

That manifests itself in two key ways. One is providing the integrated network services that make it possible to scale the network naturally. You can add servers, and they work together and you can very gracefully grow your network. Would that it were effortless, but it is clearly never effortless. But make it as painless as possible so people can start connecting work groups and grow.

The key is manageable services to keep administration overhead down so it doesn't grow linearly with the size of the network. One key are those enterprise network services — messaging, naming, security, management and administration that work together, that scale well.

The other key differentiator for our product set is that we recognize that, by definition, enterprise networks are multivendor, that it's a heterogeneous world out there. And it's going to be for a long time.

We're committed to providing network services without necessarily mandating a choice of desktop solutions because we think, in most enterprises, the desktop solution is driven by a local application need. And what works for the development group may not work for the shipping dock, which isn't what the marketing group wants, for example.

Bruno: Drew, does Novell have a different take on this?

Major: No. Our take's a little similar to elements of all of these answers. Certainly, we are focusing a lot on heterogeneity — the H word — and are continuing to do that. Novell's not a client OS company per se, though we do a few things in those arenas. Our focus is to make the H word happen, as well as focus a lot on the core file and print services.

I think another differentiation for Novell has been our focus in the fault-tolerance arena. NetWare System Fault Tolerant III was kind of everyone's favorite vaporware product for the last six years. As I've been talking about it, we are actually demonstrating it now as a capability.

Overall, really, the focus of Novell has been on trying to make distributed computing really work, and we've been independent of the LAN hardware and independent of the clients.

Certainly, since both Banyan and we are primarily focused on the NOS and don't really have our own clients or our own hardware or installed base, we're similar in that way.

The differentiation between us and Banyan is we've focused more on the file service initially. Now we're moving more into the enterprise. Banyan focused a little more on enterprise up front, and that took them to where they are now with their leadership in that area.

Basile: Several of the responses mentioned heterogeneity. I'd like each of you to comment on the practical and pragmatic features, functions and steps you've taken or plan to take to facilitate interoperability.

Segal: I probably have a different perspective than the rest of Microsoft because of my experience working at Aetna and prior to that being in the Air Force and having to deal with lots of moving parts and finger pointing.

I'm not a big fan of believing that everything connects to everything and everything interoperates with everything to no end. I just don't believe that is going to happen.

What Microsoft is doing is they're trying to allow you to load multiple stacks and talk to different resources.

With things like the WINnet API in Windows — where connecting to a file, a server or sending something out to the printer looks visually the same to the user — Microsoft's focus has been, 'How does it look to the user?' And under the covers, we try to provide an API as a connectivity option so that the guy who has to put it all together has a reasonable shot of doing so with the fewest moving parts.

PHOTOS ©1993 JOHN COLETTI

L. to r.: Rick Segal, Drew Major, Bob Nuber and John Wilson

"The focus of Novell has been on trying to make distributed computing work, and we've been independent of the LAN hardware and the clients."

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We want to make sure [the user] has the robust features and functionality to get to different items on the network or the enterprise and in as seamless a fashion as possible.

Basile: Bob, is the answer to let the desktop access as many resources transparently as possible and work out what's underneath with APIs? Is that an approach Banyan would ascribe to?

Nuber: You kind of split the world as we look at interoperability problems between the desktop-to-desktop connectivity issues and then work group to work group. And, certainly, that transparency is important at the work group level.

At the desktop level, we have groups and environments where you have different operating systems working together. The classic example is there's probably few marketing organizations around that don't have a mix of PCs and Macintoshes that need to work together. They need to share things, share files, share a common customer database, whatever that might be.

So desktop-to-desktop is really relevant in those mixed groups. But there's a different level of interoperability required when you start connecting work groups together within an enterprise.

The marketing group and the engineering group in larger organizations don't tend to share printers. They don't tend to share files, disks or modem connections. They're looking to share E-mail connectivity, larger corporate resources. And that's why, as we tried to figure out the right way to connect work groups, we concluded it was really more important to address the application level than the file and print connectivity level.

We really distinguish between the two in trying to understand the set of problems that have to be solved when you're bringing two entities together.

So we strongly feel, as Rick stated, there isn't the pat answer — interoperability as this whole checklist — and if you haven't got it, you don't have anything. That it really does vary.

Basile: Drew, I think interoperability is like obscenity. It's tough to define but I know it when I see it. How does Novell deal with the real head-scratching, hair-pulling issues such as, 'We need to get that group that didn't get on the NetWare bandwagon interoperating with the rest of the enterprise?'

Major: There's one big differentiator between the likes of us and Microsoft. We try to address interoperability more on the server side, and Microsoft is doing it at the client side. We've focused a lot on the back end, getting it to conform to each client environment.

From a file system perspective, I think we've done a very good job and have been doing that for a long time.

In terms of the interoperability of the higher level services, we're perhaps a little behind Banyan on those, but we're of course looking at those quite significantly right now.

It just depends on what you want to have and what your mix is, and certainly there's a lot of value in what Microsoft is doing, and we'll be supporting that. But we offer value at the back end, at the services end.

Certainly, there are some differences there and, in some ways, that's good. You know Microsoft's coming into the back end, and we're kind of dabbling a bit in the client environment, and we'll just see what happens.

(continued on page L4)

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LAN techies discuss strategies

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Basile: John, how about from IBM's perspective? Is the Holy Grail of interoperability within sight, within reach?

Wilson: I think it's an ongoing journey. The whole industry isn't going to converge on one network operating system, and therefore, there's always going to be interoperability issues.

As Drew pointed out, you can view interoperability from the desktop, client point of view and the server end. And we're trying to do both of those.

From the WorkPlace family of operating systems, our intention is to have a common set of API frameworks — much in the same kind of mold as [Microsoft's Windows Open Services Architecture] — that service providers can use to plug in their protocols to get to different servers.

So that would provide some degree of interoperability with different classes of service from a desktop, but that's clearly not sufficient. You've got to deal with the server issues where — just like Novell has done — you take a particular file server or print server and allow for different kinds of clients to access it transparently.

But even that's not sufficient because one of the things our customers consistently put on the top of their list is single sign-on, security integration. You've got lots of different work groups around the enterprise with lots of different network operating systems, but they don't want their customers at the desktop to have to remember three dozen user IDs and three dozen passwords to log on.

So we're trying to solve that problem. We have the basis for an architecture for that, and it is in fact based on the DCE security facilities, where basically you need to be able to have one definition of a user throughout the network. And the different network operating systems and different desktop operating systems around the network need to key their user definitions off that central source.

Bruno: Rick, can you give us an idea about services that will be added to your company's product line in the future.

Segal: Customers are telling us they want some sort of software management in place. They are downsizing and expecting base services to be available in the PC LAN arena.

And when we look at base services, we think of things like messaging services, database access services, licensing services and distribution services, so the WOSA architecture is supposed to allow that to happen. And then we're getting a large call for base messaging and database openness, which we're doing with the [Open Data Base Connectivity] and the [Microsoft Messaging Application Programming Interface] stuff.

Bruno: Bob, Banyan has made a name for itself with directory services. Beyond that, what types of services do you see coming down the road?

Nuber: We certainly have invested substantially in directory and continue to evolve that technology. Interoperability is key for us there.

The whole management front has been something that's always distinguished us, and we continue to invest there, too.

We tend to look at management as more than just managing all of those assets that are out on the network. It includes software distribution and licensing, as Rick was saying.

Inventory management, virus checking — we sort of lump all of that into enterprise personal system management. There are a lot of desktop, laptop, portable, whatever machines floating around.

Many of our customers are realizing that a substantial percentage of their [information systems] assets are not in the glass house; they're out there somewhere, and they don't really have them covered. They just don't quite know what's going on where, and they're looking for tools to manage that.

PHOTOS © 1993 JOHN COLETTI

"Many of our customers are realizing that a substantial percentage of their IS assets are not in the glass house; they're out there somewhere, and they don't have them covered."

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Another key area for us has been messaging. We continue to roll out new enhancements for our messaging engine. This year our focus is on improving the message store and its interoperability with other environments — just making it a robust application-to-application as well as user-to-user messaging environment, increasing its breadth to other NOSes.

Other areas include data management. Finding ways of doing a better job of replicating, migrating, distributing data that is out there is becoming increasingly important for our customers. Now that they can keep the network running, they're looking to go to the next layer and start managing more pieces of what's out there. And some of that is, in fact, an essential underpinning for providing robust imaging capability.

Bruno: Drew, won't the DCE obsolete some of these advanced NOS services? And beyond that, what's your vision of advanced NOS services?

Major: Well, DCE is an attempt to find standard ways of connecting and getting things to work together, and certainly, we agree in spirit with what DCE is doing. But a lot of people are taking pieces of DCE and taking advantage of those and in other areas diverging.

I'm really not sure, to be honest with you, how much we will embrace DCE. The jury's still out, from my perspective, as to what we should be doing with it for interoperability. Certainly, we're going to be doing some investigation and support some of it.

I would agree with the services that were talked about prior. They're all important. I would add perhaps the need for some more real-time video, multimedia type of capability over the LAN. And I would also see some sort of unity at some point with the telephone-type services.

In some way, it doesn't make sense now. You've got two pairs of twisted wires going to each desk — one for the telephone and one for the LAN. At some point, that ought to be one, and certainly it will be done at a hardware level. It's going to be an interesting battle between the [private branch exchange] and hub vendors in the next few years.

And from our software perspective, we'll want to be supporting both, and we just made an announcement with AT&T regarding trying to combine PBXs more closely with our file system. There'll be a lot of action happening there because inherently it makes sense to have just one set of wires running both voice, data, video and LAN traffic. And since topologies are almost identical now from a wiring standpoint, it's just a matter of getting those other things working.

"Our intention is to have a common set of API frameworks."

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Bruno: John, at IBM, what are the primary services you see on the NOS horizon?

Wilson: Some of the key services we need to provide in addition to the base net operating system facilities are things like robust transaction processing, which I've already mentioned.

Where it is practical, you can distribute resources around the LAN by using a distributed two-phase commit for a single transaction around any part of the network. I think that's going to be a key factor in facilitating the downsizing from the host into the LAN environment.

We also believe — and this is basic — that one of the major facilities we need to provide is distributed object [computing]. So as the world of computing moves from the place where it is today in the procedure environments to a world of objects, you can access those objects independent of their location in the network.

So in the end, the application developer is just faced with class libraries of objects to represent the functionality of the system, or the functionality of the applications, and can access those objects in a standard way, independent of their location in the network.

I would also agree with what several speakers have talked about, and that's system management. This is another aspect of the downsizing problem.

Now that you've scattered the resources of the enterprise out of the glass house and who knows where, you've got to be able to manage them. You've got to be able to distribute software. You've got to be able to do the problem determination of the software no matter where it is. And you've got to be able to configure it and update it and refresh it. That's a major inhibitor to the growth of the LAN environment.

Bruno: Another area of interest among users is what NOS vendors have done to address database connectivity. One of the things Microsoft has done was to commit to embedding a database API into its network operating system. Does Banyan support that concept? If so, is that something you're going to be doing in the future?

Nuber: I presume you're talking ODBC. We view that as something plugged more into the Windows environment than the NOS environment. It should function perfectly fine in the VINES environment and in the [Enterprise Network Services] environment where Windows is present.

We've been talking with many of the vendors, looking for database interoperability, connectivity hooks and thus far seeing that we work with them.

Bruno: John, would you agree that is more of an operating system function?

Wilson: I view it as another network operating system facility. It's the resource manager that sits on the network operating system, just like any other resource manager provides an API.

In fact, it's more than just an API. It has to be a framework where you can plug in different protocols underneath that API. And yeah, we're in the process of doing that. It's not ODBC, it's [the Integrated Database API]. We're working on that.

Bruno: Drew? Do you have a different approach

Major: Not really. We're not doing the Microsoft one, but I think there'll be adherence to standards. And that's not something fundamentally we're selling. We have a database, really a record manager, with Btrieve, but we're not really in the database business ourselves, so let the other guys fight it out.

Bruno: Rick, what's Microsoft's thinking on ODBC?

Segal: There's lots of thinking that goes on. It goes back to what I had said earlier in terms of WOSA. The base operating system ought to have a robust set of

(continued on page L6)

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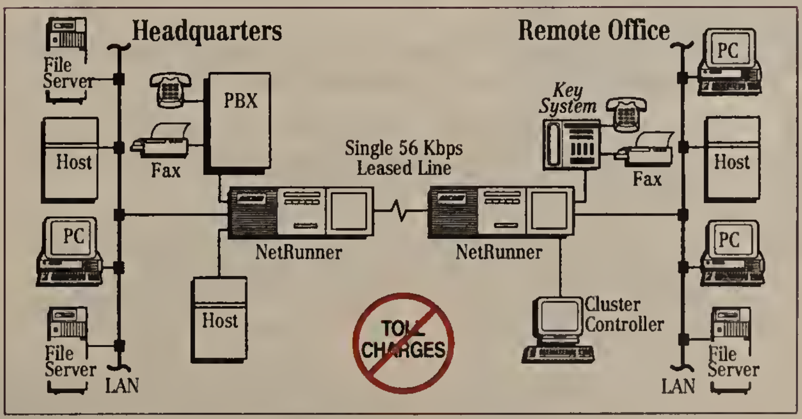

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LAN techies discuss strategies

continued from page L4

features and functionality both for the developer and for the applications that are allowed to run in that operating system.

The APIs that go into the box are based on customer demand. In this case, they're [customers] saying, 'We want to be able to have multiple database providers plugged in, plug 'n' play with databases.'

I happen to agree with John that it's not part of the core operating system in the sense of the kernel. It is a set of APIs that is a function of the operating system. We have been working with Apple to get those features onto System 7, so there is some cross-platform work under way.

Basically, it's just viewed as an additional feature of the operating system to encourage software developers to use that as a development platform and for end users to feel the operating system is giving the customer a good set of things they can solve business problems with.

Bruno: At this point, I'd like to open up the floor for questions. If anyone has a question they would like to ask, just step up to the mike.

Attendee: Does it make sense to use the DCE security services to have a single registration across different network operating systems?

Nuber: Sure. We think one of the very interesting pieces of DCE is indeed the security component. On the other hand, there are other alternatives — a nice private-key model for doing some things. It won't interoperate with the world, but it's a good vehicle for trying to accomplish some of those things.

Anything that helps reduce the entropy of enterprise networks is useful, and the DCE security model may be quite valuable from there.

There are certainly areas in technology where we're investing [similarly], but we're doing it from different angles — different design centers, different target customers, different sets of problems we're trying to solve, which gives the model a different weighting, in essence.

We may solve the same problems in very different ways.

Drew talked about how Novell approaches file system views and their view of interoperability, to contrast that with Microsoft. Those differences exist across the board. We're all trying to invest in similar technologies but looking toward our particular piece of the market to solve those problems.

Major: I'm really not sure exactly what our current thinking is [on DCE]. We are going to be doing a lot of investigation and some development for different levels of interoperability with DCE, starting with gateway-type things. There's certainly the option of throwing away what we've got now and totally embracing DCE. But that's less probable.

We just have to see and play with it. I think we're all hedging a bit here and trying to not paint ourselves into a corner. But we all have our ongoing agendas, past development and past installed base we have to be true to, and that sometimes constrains us a bit.

So I really don't know. DCE certainly has not proven a 100% safe bet to me. There are a lot of hot ideas there, but perhaps what'll happen is some of the areas will do well and some of them won't.

Nuber: I just wanted to follow up, not in response to what Drew said so much as a clarification of something I said. Where we think there are valuable components to DCE is where their technology has been fairly well understood. Standards efforts like that make sense when they're made after the industry understands how to solve a problem. Then the challenge is getting everybody to agree on how to do some things.

I mentioned security as one area where I think DCE has really added some value. RPC is another one where there's some fairly understood technology. But in many other areas of DCE, we keep learning. Technology keeps churning.

Bruno: Rick, would you agree?

Segal: Yeah, there are certain pieces that make sense to a company's particular agenda. We happen to be very strongly in favor of the RPC stuff that's going on. And we're looking at other pieces.

Drew was very tactful, and maybe I could be a bit more blunt about it. There is some competition, and sometimes that competition tends to generate overlap.

We all want to believe we get input from our customers, and our customers probably have the same skewed view as we do. And we go marching down that path, and the bet is at the end of the road, we have a bigger bag of money.

Bruno: Gentlemen, thank you for your time. ◻

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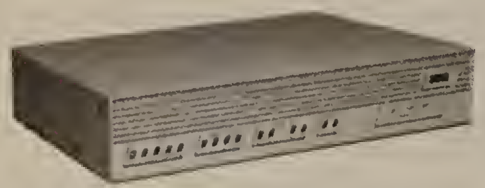

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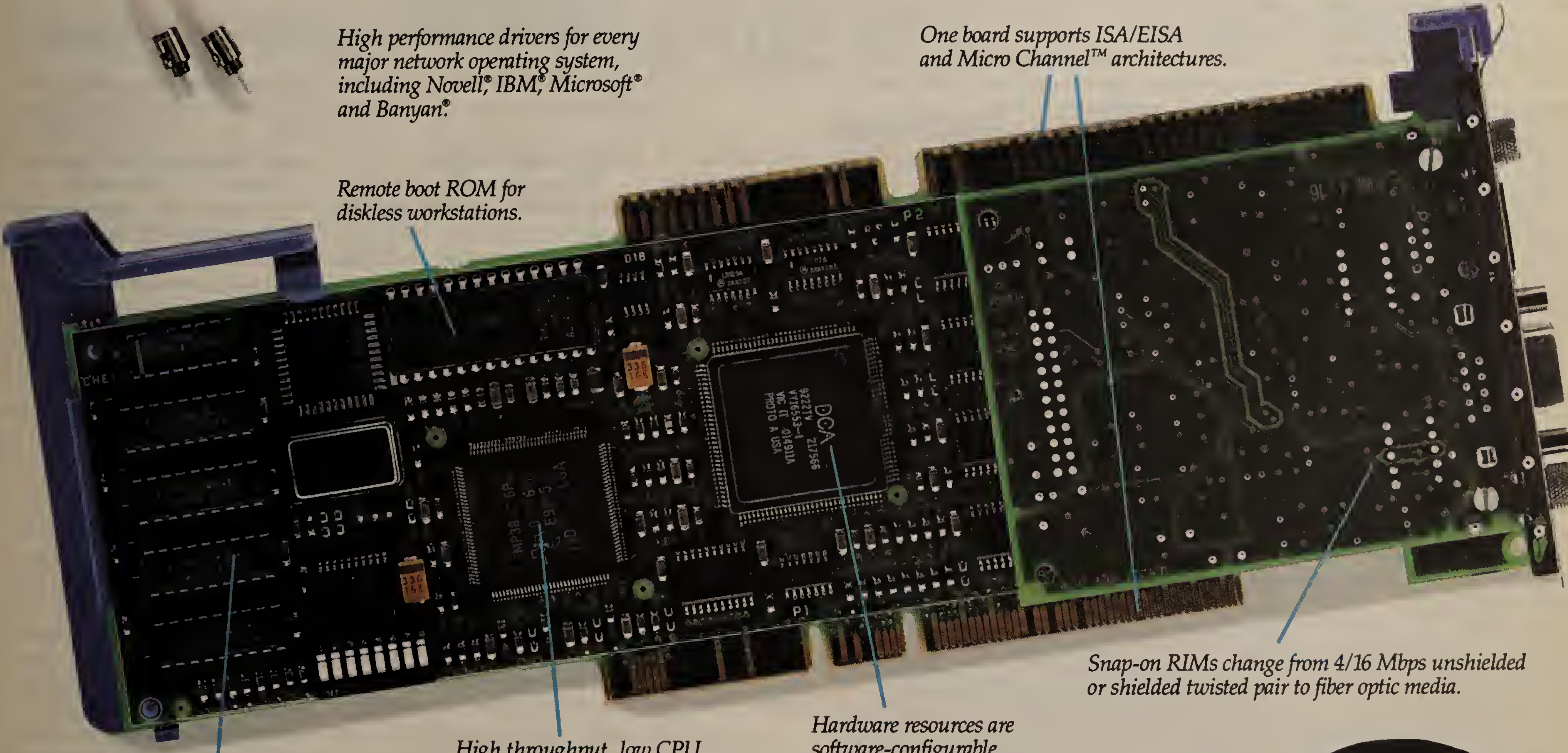

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Circle Reader Service #33

Novell makes Unix support more visible

By Caryn Gillooly
Senior Editor

While Novell, Inc.'s name is not synonymous with Unix — at least, not yet — the market-leading LAN vendor currently offers a range of Unix-related connectivity products, from simple TCP/IP tools to OEM versions of NetWare tuned for specific Unix platforms.

> "NetWare for Unix is for larger Unix machines that need to crunch big applications."
>
> ▲▲▲

Novell acknowledges today that many NetWare and non-NetWare users do not realize the extent to which the company supports Unix. While some observers may view Novell as a recent entrant into the Unix market with its late 1992 acquisition of Unix Systems Laboratories, Inc., the company claims it is simply building on the Unix support it has been developing for years.

"We're not making a bigger Unix push; it's just becoming more visible," said James Tolonen, chief financial officer at Novell, which is based in Provo, Utah.

In June 1989, Novell's acquisition of Excelan, Inc. brought Transmission Control Protocol/Internet Protocol capabilities to NetWare. Although the first products that came from the deal focused primarily on Digital Equipment Corp. VAX-to-Unix connectivity, over the past four years, Novell's Unix product family has matured into six primary offerings (see graphic, this page).

At the high end, Novell offers NetWare for Unix for powerful workstation and minicomputer servers. NetWare for Unix offerings, which used to be called Portable NetWare, are versions of NetWare 3.X running on proprietary computing platforms, such as Data General Corp.'s AViiON or Hewlett-Packard Co.'s 3000 line.

Novell does not actually sell NetWare for Unix, which provides the same file, print and backup services provided through NetWare. It is sold directly from about 30 vendors for their specific platforms.

"NetWare for Unix is for larger Unix machines that need to crunch big applications," said Robert Davis, vice president and general manager of Novell's Connectivity Products Division in San Jose, Calif. He pointed out that users within NetWare for Unix environments can communicate with NetWare 2.X and 3.X servers.

The most widely used Unix product sold by Novell is NetWare NFS. NetWare NFS is a set of NetWare Loadable Modules running on a NetWare 3.11 server that gives Unix clients and servers access to NetWare services through their own familiar command set.

NetWare NFS provides Network File System file service to Unix clients and a bidirectional print gateway between NetWare and Unix. The software also includes a File Transfer Protocol gateway, which lets FTP clients access files on any NetWare server on the network, and an X Window Systems console utility that lets X clients manage NetWare servers.

NetWare NFS, however, is more than just a Unix-to-NetWare link. NetWare users are also provided access to Unix files stored on a NetWare server through the native NetWare interface.

Novell also offers a scaled-down version of NetWare NFS, called NetWare FLeX/IP. This product provides all the services of NetWare NFS — the print and FTP gateways and management console — but without the NFS capabilities.

(continued on page L12)

Novell does Unix

Product	Description
NetWare for Unix	A version of NetWare that acts like an OEM for workstation and minicomputer Unix platforms
NetWare Network File System (NFS)	A set of NetWare Loadable Modules (NLM) that gives NetWare-based Unix users NFS file services as well as access to NetWare services
NetWare FLeX/IP	A set of NLMs that provide the same capabilities as NetWare NFS without the NFS file services
UnixWare	A version of Unix System V release 4 that has built-in NetWare Core Protocols and uses Novell, Inc.'s IPX/SPX
LAN WorkPlace	Software that gives a NetWare client TCP/IP capabilities
LAN WorkGroup	Server-based software that gives a number of NetWare clients TCP/IP capabilities

GRAPHIC BY SUSAN J. CHAMPENY

Macs integral to infrastructure

continued from page L1

database connectivity. "Macintosh enterprise database connectivity considerably exceeds that . . . of PC database connectivity," the study stated.

Not surprisingly, Macintosh-intensive companies typically use a different mix of databases than do equivalent PC shops, which tend to be oriented more toward IBM mainframe systems. Acius, Inc.'s 4th Dimension, the predominant Macintosh database, for example, ran about equal in Macintosh connectivity with IBM's DB2.

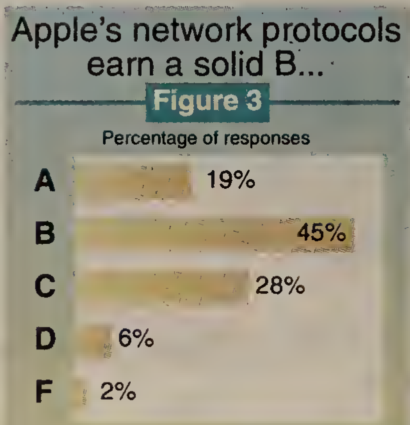
Passing grade

Despite the intensive use of Macintoshes to access corporate databases, survey respondents graded the Macintosh's overall networking capabilties at an unremarkable B-. Apple Computer, Inc.'s networking protocols for the Macintosh earned a solid B, while the company's network hardware received a B-.

Key complaints focused on the limitations of AppleTalk, including LocalTalk's anemic performance, inadequate network management tools and poor security. One survey respondent praised the network operating system as "an early contributor to our success because of simplicity," but another dismissed it as "proprietary, unmanaged and nonscalable."

Apple's network protocols earn a solid B...

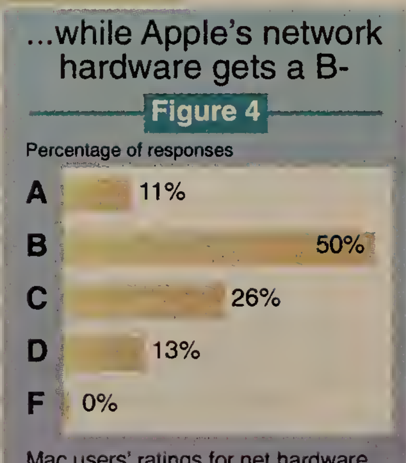
Figure 3



Almost two-thirds of Mac users thought Apple's networking protocols deserve a grade of an A or a B.

...while Apple's network hardware gets a B-

Figure 4



Mac users' ratings for net hardware cluster in the middle of the range.

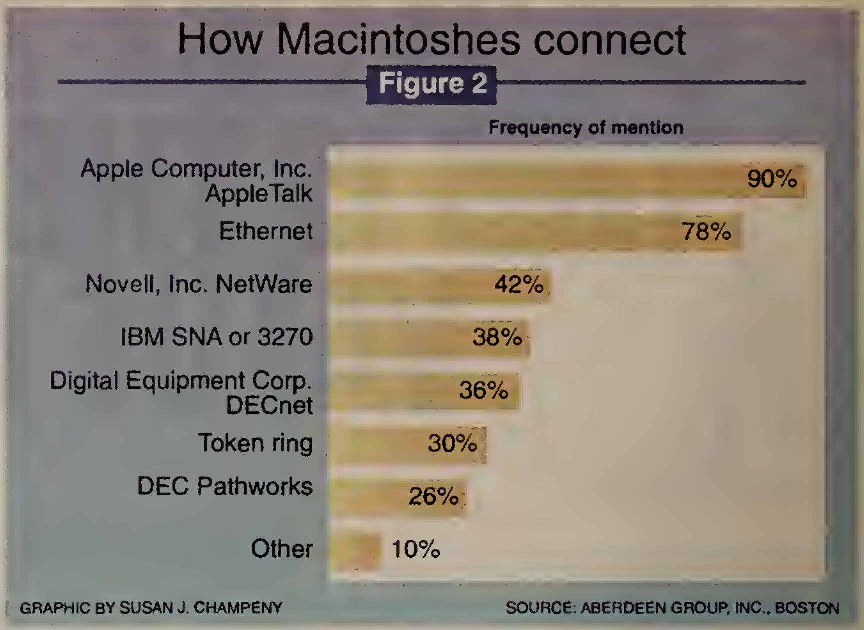
SOURCE: ABERDEEN GROUP, INC., BOSTON
GRAPHIC BY SUSAN J. CHAMPENY

In order to fix things, the survey respondents demanded improvements in Apple's networking software as well as greater integration with other technologies.

In the Aberdeen Group's view, help is on the way via Apple's plans for an Application System/400 Macintosh client and the plans of Apple's business partners to develop support for AppleTalk in NetWare 3.1 and in IBM's 6661 router.

How Macintoshes connect

Figure 2



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: ABERDEEN GROUP, INC., BOSTON

Limited applications

The current problems with interoperability have limited the corporate usefulness of Macintosh nets, even as they proliferate through the corporate world.

Networking applications such as electronic mail are considered a primary use of Macintoshes for more than a quarter of the companies in the survey. But many companies still look at these communications functions as a supporting role.

As one respondent put it, "The Macintosh network is the lifeline of the company for communication, [E-mail and file sharing]. However, our business systems are centrally located on IBM mainframes."

Many corporate users also worry that Apple's current fascination with leading-edge consumer products, including personal digital assistants such as Newton, mean networking will take a backseat. "I would have chosen more robust networking over multimedia as the next area to emphasize," was one response.

Given these interoperability issues, it's no surprise that the survey showed that Apple users prefer to use their Macintoshes in peer networks with other Macintoshes or PCs. Unix workstations and servers were much less prevalent in Macintosh-oriented organizations.

Two-thirds of the corporate users said Apple's servers are adequate today, but more than three-quarters were concerned that these products would be inadequate for future needs. Users did not see raw computing power as Apple's strength, and they worried about the servers' ability to handle increased work loads and the intensive number-crunching needed for new applications such as multimedia.

Paradoxically, however, this may present Apple with a market opportunity. Users said they wanted Apple to introduce a database server and a larger file server, and, according to the Aberdeen Group, it expects Apple to introduce a new line of servers within six months and follow up with Reduced Instruction Set Computing-based servers in 1994.

How the survey was done

According to the Aberdeen Group, the survey of 50 key corporate users of Apple technology chose its anonymous participants from a varied selection of industries — primarily manufacturing, services, financial and insurance, and utilities. One-quarter of the corporations ranged from about $5 million to $100 million in revenue, half fell in the $100 million to $1 billion range, and the last quarter topped $1 billion.

Some of the respondents ranked among Apple's largest customers and most of them mix their Macintoshes with other desktop technologies. The majority of the companies surveyed have been committed to Macintoshes on some level for years, generally well before the debut of Apple's new lower price strategy in 1990.

The Macintosh's share of the desktop in the companies surveyed ranged from 100% to less than 10%, with 850 Macintoshes and 950 PCs being the average. That commitment to Macintoshes far exceeds the typical U.S. corporation, where the Aberdeen Group estimated that Macintoshes represent about one in 12 desktop computers.

As a group, the participants had more than 125,000 desktop machines of various types and planned to buy approximately 14,000 Macintoshes in the near future. Those purchases will be largely driven by the downsizing of mainframe systems.

New security products for WANs and LANs debut from Semaphore

By Fredric Paul
Senior Editor

SANTA CLARA, Calif. — Semaphore Communications Corp., formerly Advanced Encryption Systems, last week introduced the Network Security System (NSS), a hardware/software combination designed to control network access and protect data as it travels across LANs and WANs.

Also in the security field, Mergent International, Inc., formerly Pyramid Development Corp., has announced Version 3.00 of its flagship PC/DACS for DOS/Windows workstation security product. The new version reduces memory requirements and simplifies installation and administration.

NSS consists of Network Security Center (NSC) software and the Network Encryption Unit (NEU), an external hardware box. Together, the two components encrypt data at its source and keep it unreadable until the information reaches its destination.

> The OS/2-based NSC application supports a graphical user interface to give network administrators easy access to the system's full palette of security controls.
>
> ▲▲▲

The system works only with IEEE 802.3 Ethernet networks, although support for IBM Token-Ring and Fiber Distributed Data Interface local-area networks is planned, said Clifford Reeser, director of Semaphore's new business development. On the wide-area network side, NSS will work with such services as X.25, frame relay, Asynchronous Transfer Mode and Switched Multimegabit Data Service.

The OS/2-based NSC application supports a graphical user interface to give network administrators easy access to the system's full palette of security controls, enabling them to determine who gets what level of access to all system resources, from servers to databases.

Security hub

The Reduced Instruction Set Computing-based NEU box acts as a security hub, controlling network connections for as many as 16 nodes. It uses the Data Encryption Standard and the RSA Data Security, Inc. algorithms to:

- Control user access to specific network devices as well as workstation access to all or portions of the network.
- Detect both internal and external masquerade threats.
- Detect data modification attempts.
- Ensure data confidentiality.

Under the terms of another recent agreement, Semaphore's network security products are built by AT&T Federal Systems' Custom Manufacturing Services. AT&T's Secure Communications Products team has nonexclusive distribution and marketing rights.

Depending on configuration, the NSC software costs less than $10,000, while an NEU box costs $3,495.

At Mergent International, the new version of PC/DACS for DOS/Windows automatically takes advantage of available memory to reduce conventional memory requirements to as little as 1,000 bytes, said John Worthen, the firm's president and chief executive officer. The program's remaining 59K bytes can reside in extended or upper memory.

PC/DACS is a security utility that lets administrators control a workstation's network identity, password, access to network resources and auditing procedures.

A new autosensing capability lets PC/DACS automatically configure itself to the network, while Single Step Installation enables boot protection and encryption of sensitive data during the initial installation, thereby eliminating a separate time-consuming procedure.

PC/DACS for DOS/Windows is available now, while a similar upgrade to the OS/2 version of PC/DACS is due out later this year. Version 3.00 sells for the same price as earlier versions. A typical 1,000-unit license costs about $100,000, while a 25-unit license sells for about $4,000. ◪

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Coactive enters peer market with product targeted to small users

By Caryn Gillooly
Senior Editor

BELMONT, Calif. — The peer-to-peer local-area network market will get a new entrant this week with start-up Coactive Computing Corp. expected to introduce the Coactive Connector system.

According to executives from Coactive, based here, the new LAN is designed for the low-tolerance user who does not know or want to know how to install an adapter card in a personal computer.

"This isn't about solving enterprise networking needs," said Tess Reynolds, vice president of marketing at Coactive. "We're targeting end users in small departments, small offices or small businesses looking for casual file- and printer-sharing capabilities."

Seth Neiman, Coactive cofounder and vice president of product development, agreed. "We're not even going after the current typical peer-to-peer market customers," he said.

The product is a combination hardware/software package that can connect DOS- and Microsoft Corp. Windows-based PCs as well as Apple Computer, Inc. Macintoshes.

The hardware is not the typical card needed with other do-it-yourself peer-to-peer products, but rather, it is an external coprocessor that attaches to the parallel port of a user's PC.

On the other side of the connector is another parallel port, so the user can still attach a printer to the PC, and an RJ-11 connection that enables the PC to be linked to the next workstation via telephone wire. DOS and Windows users must load a single diskette.

The installation process requires the end user to answer two simple questions in order to begin sharing files and printers with other users on the LAN. However, since Coactive Connector for Macintosh uses LocalTalk and supports Apple's System 7, no software is necessary for Macintosh users.

The product works by creating a shared directory. Users copy files into the directory that can be shared by others on the network. For security purposes — the product does not require passwords — users can send confidential files to one another via private directories that cannot be accessed by all users on the network.

Coactive Connector for Windows and DOS and Coactive Connector for Macintosh will be available in April and will be priced at $149 and $29 per node, respectively. ◘

System gives users mainframe storage

continued from page L1

software that resides on the SMU, jointly developed with Epoch Systems, Inc. of Westborough, Mass.; and software that resides on the Unix clients.

The SMU sits directly on an Ethernet local-area network and communicates with the workstations using the Transmission Control Protocol/Internet Protocol.

To the workstations, the SMU acts as a local storage management system, storing and retrieving files for Unix workstations on the same net.

The core SMU software automatically migrates less-active data to and from the 4400 library, which has the capacity to store up to 19.2 terabytes of uncompressed data.

Optional Migration software will automatically migrate inactive files on individual workstations to the 4400 library, while optional Backup software will automatically back up and restore files residing on individual workstations to the 4400.

Paying the price

What may seem like infinite storage, however, has its price.

In terms of access time, when a user requests a file that is resident on the NearNet SMU, the information is retrieved at server speeds.

However, according to Kleinschnitz, when a user requests a file that is resident on the library, it could take as much as "a couple of minutes" to retrieve the information.

The cost in terms of dollars is also significant. Pricing will be configuration-based, and, although it is not yet final, the average cost is expected to be about $200,000, not including the library. The system will be available in the second half of this year. ◘

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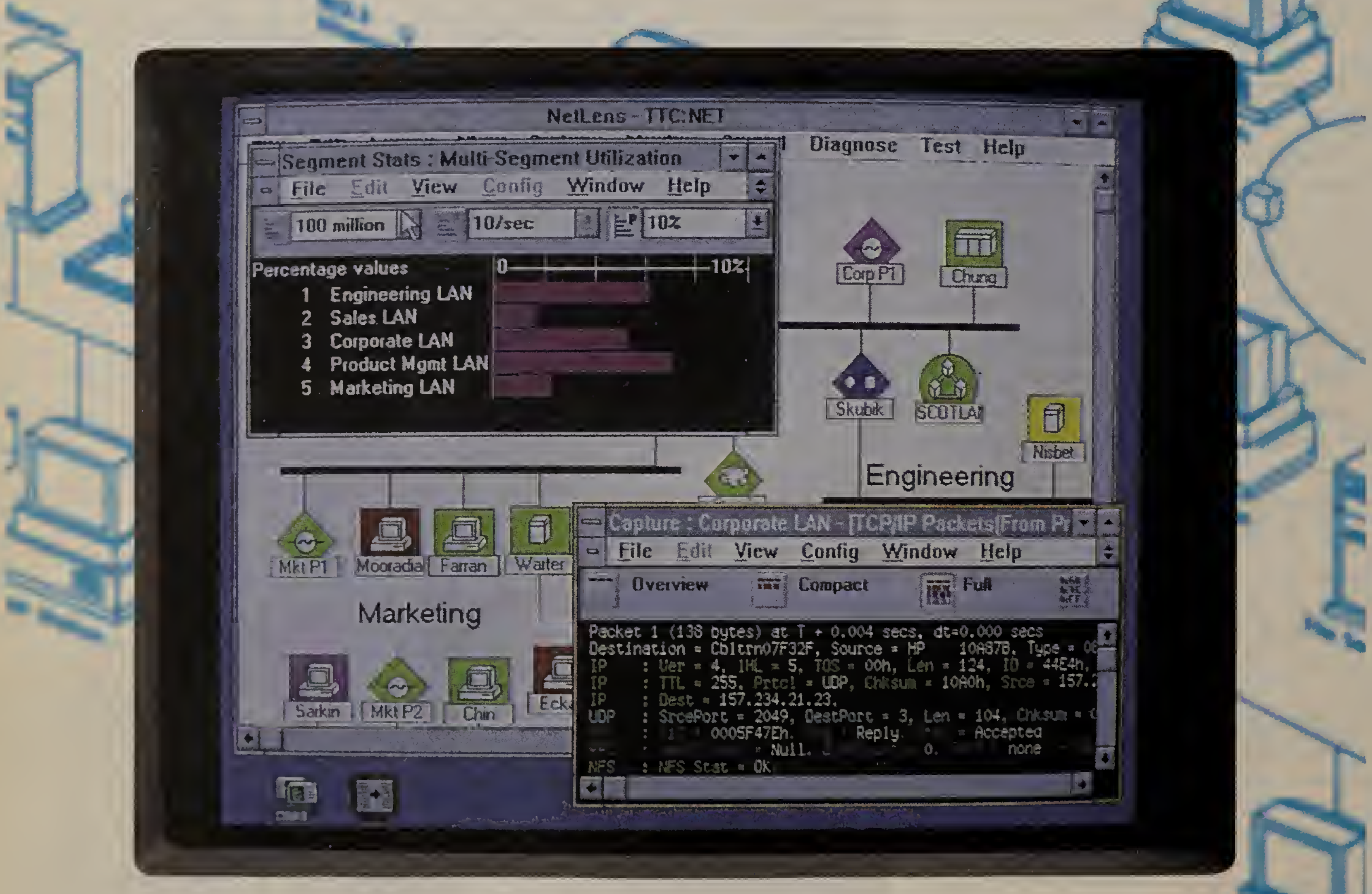

```
Packet 1 (138 bytes) at T + 0.004 secs, dt=0.000 secs
Destination = Cbltrn07F32F, Source = HP    10A87B, Type = 0
IP    : Ver = 4, IHL = 5, TOS = 00h, Len = 124, ID = 44E4h,
IP    : TTL = 255, Prtcl = UDP, Chksum = 10A0h, Srce = 157.
IP    : Dest = 157.234.21.23.
UDP   : SrcePort = 2049, DestPort = 3, Len = 104, Chksum = 
      :        0005F47Eh.          Reply          = Accepted
                     Null.                 0.           none
NFS   : NFS Stat = OK
```

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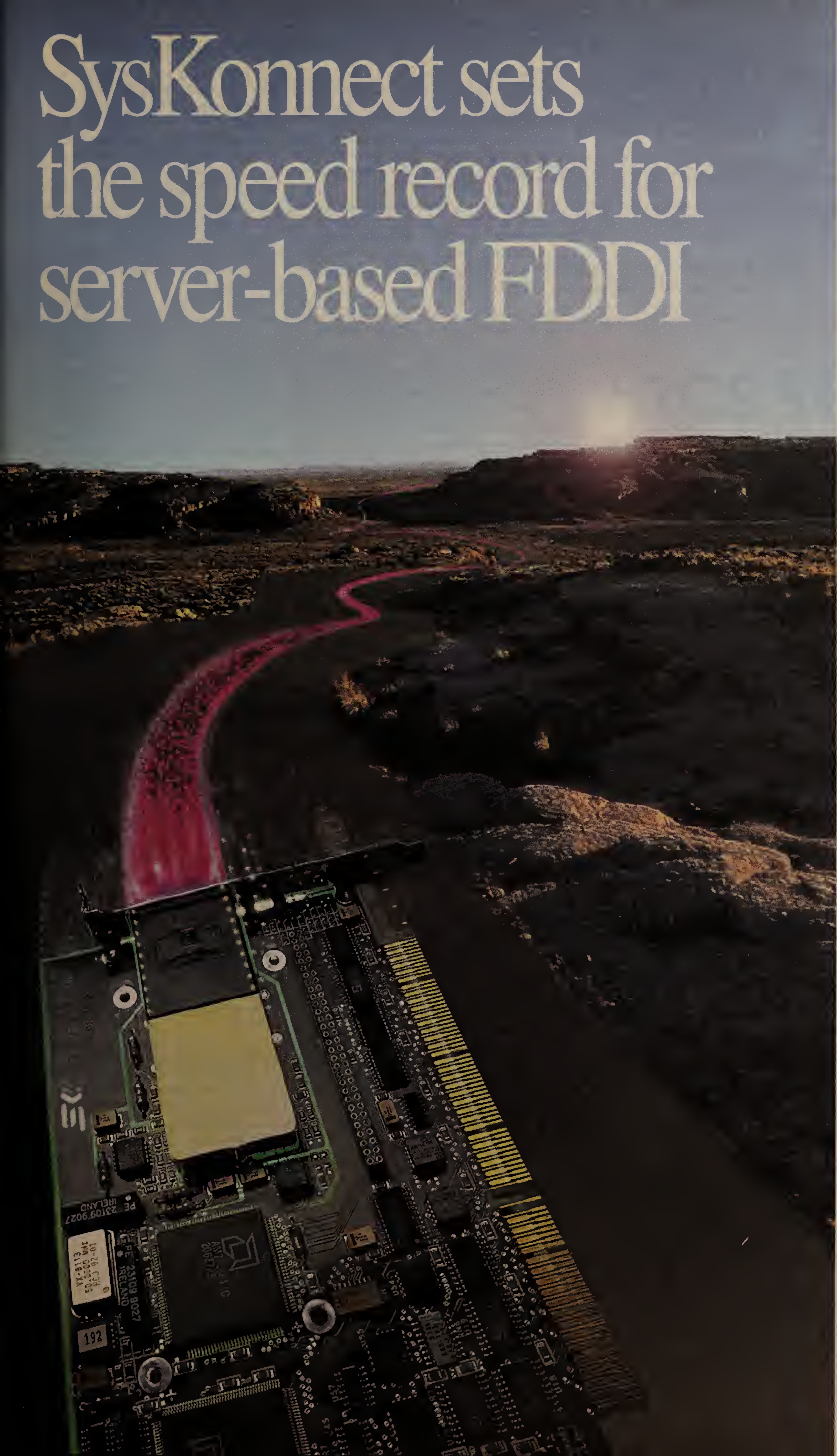

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Circle Reader Service #44

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Intel touts its new ISA/PCMCIA E-net controller as industry first

By Caryn Gillooly
Senior Editor

FOLSOM, Calif. — Intel Corp.'s Connectivity Division last week brought out what it says is the industry's first Ethernet controller that supports both the Industry Standard Architecture (ISA) and Personal Computer Memory Card International Association (PCMCIA) interfaces.

The 82595 Ethernet Controller can be used to build a single adapter card that will support local-area network attachment for either a desktop PC or a laptop or portable computer.

Although the controllers are initially targeted toward OEMs that will use them in their adapters, Intel will offer its own 82595-based adapters by the end of next month, although the company would not provide further details.

The 82595 controllers connect directly to an eight- or 16-bit ISA bus or PCMCIA interface. Each controller supports up to 64K bytes of local buffer memory.

According to Michael Anzilotti, 82595 product manager at Intel's Connectivity Division here, the increased local memory — which is usually only 8K or 16K bytes — is one of the more important features of the new controller.

"[Microsoft Corp.'s] Windows NT and future versions of [Novell, Inc.'s] NetWare will require larger local memory buffers," he said.

The 82595 also includes an interface up to 256K bytes of erasable programmable read-only memory or flash memory. This provides a place to store drivers or node configuration information, ultimately providing the customer with completely software-configurable adapters.

The serial interfaces support both 10Base-T and attachment unit interface connections.

Randall Scott, general manager for Intel's Connectvity Division, said the controllers will help to integrate laptop users more easily into network environments.

"The growth of the mobile computer marketplace will be fueled by more fully functional systems that include on-board networking capabilities, as well as removable LAN cards, both of which can be achieved with the 82595," he said.

"Size, power and ease of use are moving up on the [customer] priority list," said Chris LeBlanc, 82595 product-line manager at Intel's Connectivity Division. As a result, by 1996, 80% of new machines sold will have PCMCIA slots, he said.

The 82595 will be available in March to OEMs. ☑

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Novell makes Unix support more visible

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"A lot of customers use FLeX/IP just to share peripherals," Davis said. "It's for people who don't need NFS capabilities for wide-area connectivity."

In addition, Novell markets UnixWare, a shrink-wrapped version of Unix for Intel Corp. platforms that is optimized to run in a NetWare environment.

The software includes Unix System V Release 4, a NetWare shell and Novell's NetWare Core Protocols, and communicates with the NetWare server using Novell's own Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX).

There are actually two UnixWare versions available today — UnixWare Personal Edition, designed to be a client operating system, and UnixWare Application Server, designed to be a server operating system.

TCP/IP portfolio

For TCP/IP connectivity needs, Novell provides LAN WorkPlace. This is basically a TCP/IP protocol stack that resides on the end-user machine, whether it be a DOS, Windows, OS/2 or Apple Computer, Inc. Macintosh — Novell offers packages for each client type.

Another TCP/IP package, LAN WorkGroup, resides on the NetWare server and provides TCP/IP connectivity to all clients, regardless of type.

What does the future hold? Well, the expanding range of Novell's Unix product offerings is a good indication that company executives see Unix taking on a more prominent role within corporate networks.

"We'd like to see 30% of Intel platforms running Unix within five years," Tolonen said. ☑

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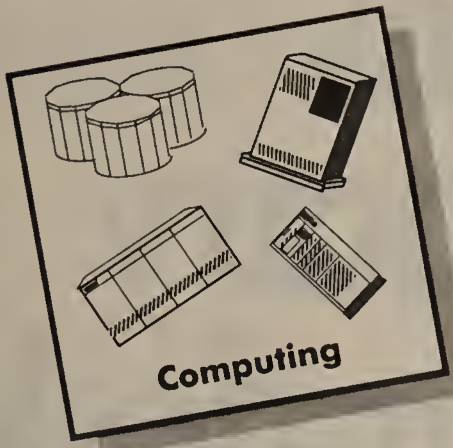

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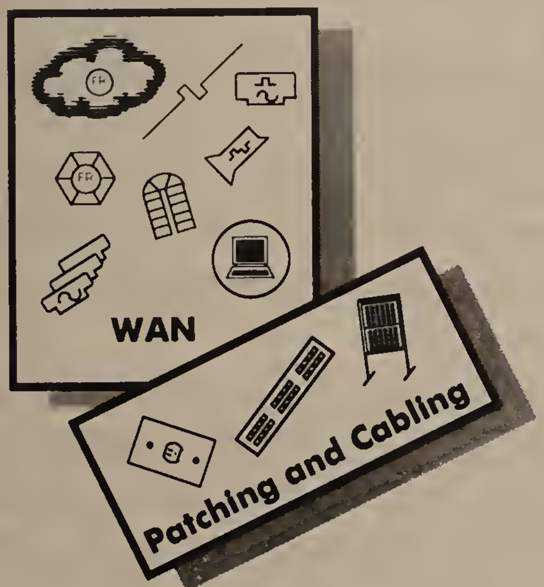

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

Two-thirds of the 1,000 largest U.S. companies surveyed by Forrester Research, Inc. say the IBM 6611 router will have no impact on their networking plans. Why is IBM so impotent? Users say the vendor lacks credibility in internetworking.

Link Notes

Zenith Communication Products this week will announce at ComNet '93 in Washington, D.C. several enhancements to its personal computer-based Galaxy Exchange bridge, including the ability to run it on an Intel Corp. 80386-based platform. When implemented on an 80386 machine, the bridge can support up to six local- and wide-area network interfaces. The current version runs on 80286 PCs and can support four interfaces.

The vendor will also introduce a Simple Network Management Protocol agent for the bridge as well as its own SNMP-based net management system. Dubbed Galaxy Network Management, it uses a Windows-based graphical user interface with Hewlett-Packard Co. OpenView templates.

Zenith also added an X.25 wide-area interface. Previously, the bridge supported 64K bit/sec and T-1 WANs.

The Galaxy Exchange costs $5,995, and Galaxy Network Management costs $4,995. Both are available now.

Combinet, Inc. last week announced two new bridges and two net management offerings. The Everyware LC/BRI Bridge is a 10Base2 thin Ethernet bridge that links re-

(continued on page 22)

INTERNETWORKING MONITOR

BY SCOTT BRADNER

Apple's on-again, off-again networking plan

Way back in 1983, I was part of a Harvard University expedition to a maker of home microcomputers to see what was being billed as a whole new idea: computers people would actually want to use. Well, it turned out not to be something new under the sun — I had been to Xerox Corp.'s Palo Alto Research Center a few years before — but it was exciting and very promising.

An advanced graphical user interface (GUI) and a mouse is what set Apple Computer, Inc.'s Macintosh apart from the rest of the crowd for the average user; its intrinsic networking features is what made it work in a crowd.

The next year, I went to an early developers' tutorial for those in the education business on Apple's new network protocol called AppleTalk. (Apple has always been good at arbitrary capitalization.)

The class had a mixed view of AppleTalk. While we could see the difficulty in stuffing a standard protocol suite into a 128K-byte memory space with something left over for an operating system, we were still impressed with the breadth of design that went into it.

Most of us would have preferred that Apple had instead gone with the Transmission Control Protocol/Internet Protocol so it would have been compatible with the emerging standards on our networks.

However, the Macintosh is a computer born to network. One uses the built-in networks to talk to printers, access file servers and exchange electronic mail, among other things. The Macintosh networking functions are well documented and easy to use.

It was only a few months after Macintoshes started to become available in the educational community that student-programmed, interactive, multiuser network-based games started to appear. If that seems normal, you should remember that when the Macintosh was introduced, few computers of any size came with network interfaces by default.

Apple was asked to provide integrated TCP/IP support at each annual meeting of the Apple University Consortium. But it was a research organization —the National Center for Supercomputer Applications — that finally produced the first widely used TCP/IP driver for the Macintosh.

It was a number of years before Apple produced an implementation of its own, which they called MacTCP. But Apple has never made it easy to get MacTCP; you cannot go down to the corner software store and get a copy. You have to get it through what is to most people an obscure developers' organization. And that hasn't been Apple's only networking shortcoming.

The PowerBook tale

When it introduced the PowerBook series of laptop computers, Apple also introduced AppleTalk Remote Access (ARA), which is a way for a remote Macintosh to dial into a local AppleTalk network. Because ARA lets someone on the road with a PowerBook get back into their home network and read E-mail, access files and other things, it seems logical that ARA be included with all PowerBooks. But not to Apple.

With Microsoft Corp.'s Windows catching up with the GUI, Apple seems to want to continue to undifferentiate itself. It is not providing Apple-Talk Remote Access and it is raising

(continued on page 22)

Vendors expanding service to woo users

Firms look to gain advantage by meeting user demand for increased service/support offerings.

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — As hardware devices become more of a commodity and networks increase in complexity, service and support is increasingly becoming the decisive factor in product selection.

In response to its growing importance, many internetwork vendors are reshaping and extending their service and support programs in an effort to distinguish themselves from competitors.

3Com Corp. last week expanded its Professional Services Partner Program by adding a set of modular consulting and project management services that focus on net design, surveying and mapping.

In a related announcement, the company said it is also seeking to establish a support alliance — comprising internetworking vendors and driven by user demand — that would set service performance standards for the network industry.

These actions come on the heels of recent service plan upgrades by both SynOptics Communications, Inc. and Ungermann-Bass, Inc.

Under 3Com's expanded service program, the company will provide users with specific guidelines, plans, requirements and implementation time tables to help them manage a new data net, enhance an existing one or integrate multiple disparate nets.

3Com's planning and design services, which can now be purchased as a modular unit, assist the user in installing a network that can not only meet current network needs, but also provide enough flexibility for future growth as business and network needs change.

Users will receive performance specifications, detailed topology drawings and complete documentation for use in implementing a network.

3Com's new net survey and

(continued on page 20)

New analyzer for remote sites debuts

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — To ease the task of troubleshooting networks, Tekelec, Inc. will unveil at ComNet '93 here this week a LAN/WAN protocol analyzer for remote offices that can be tapped into by a net manager at a central site.

The company is also expected to announce network analyzer support for Switched Multimegabit Data Service (SMDS), as is Wandel & Goltermann Technologies, Inc.

Tekelec's new Chameleon 1800-X analyzer is based on the company's Open Diagnostic Access architecture, which provides users with simultaneous wide- and local-area network internetworking analysis.

The 1800-X, which is a Unix-based, rack-mounted WAN protocol analyzer, can be accessed from a central site using an X Window System workstation. When alerted to a problem at a remote site or during a scheduled maintenance check, a net manager can configure a remote 1800-X to capture packets for a specified length of time and set alarm thresholds that will be triggered if certain preset parameters are exceeded.

According to Jason Chee, senior product specialist at Tekelec, by allowing for remote access and centralization of diagnostics, the 1800-X can reduce costs by saving travel time and eliminating the need for troubleshooters at each remote site.

LAN protocol decodes supported include the Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. DECnet, Open Systems Interconnection, Xerox Corp. Xerox Network Systems, Banyan Systems,

(continued on page 20)

Telebit merges with Octocom to broaden reach

SUNNYVALE, Calif. — Telebit Corp. has announced an agreement to merge with Octocom Systems, Inc. in an effort to expand Telebit's reach into the global market as well as obtain advanced modem technology for its dial-up router products.

Paul DePond, Telebit's vice president of marketing, said the merger with Octocom will give the vendor the ability to market its NetBlazer line of dial-up routers on a worldwide scale.

Almost 92% of Octocom's revenue derives from non-U.S. sales, while Telebit's current operations are almost exclusively based in the U.S.

In addition, DePond said modem maker Octocom will furnish Telebit with next-generation V.fast high-performance analog modem technology, which Telebit will use in its remote local-area network access products to provide users with faster access to central sites via dial-up analog and digital lines.

The fruits of that effort will be revealed in a new family of NetBlazer products the vendor is scheduled to introduce next month.

The terms of the new agreement calls for Octocom stockholders to exchange their shares for approximately five million shares of Telebit stock. Telebit currently has about 7.5 million shares of common stock outstanding.

New analyzer for remote sites debuts

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Inc. VINES, Novell, Inc. NetWare, Apple Computer, Inc. AppleTalk and Sun Microsystems, Inc. Network File System.

WAN services supported include frame relay, X.25 and Integrated Services Digital Network Primary Rate Interface. The company plans to add SMDS capabilities in the near future.

An Ethernet option is currently available that monitors real-time data to test and diagnose problems at 10M bit/sec without affecting network activity. Data is displayed in graphic and tabular formats, and can be captured to a 4M-byte buffer. Support for token ring and Fiber Distributed Data Interface is also planned.

> The Unix-based 600 automatically monitors all layers of the SMDS protocol stack for errors. Remote operation is supported through the X protocol.

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Chameleon 1800-X is available now, and base pricing begins at $21,000, which includes a T-1 or E-1 interface. The Ethernet option costs $7,500.

Tekelec will also announce the Chameleon 600, a portable WAN analyzer that will monitor traffic across SMDS' Subscriber Network Interface layer at speeds from 1.544M to 45M bit/sec.

The Unix-based 600 automatically monitors all layers of the SMDS protocol stack for errors. Remote control operation is supported through the X protocol via an Ethernet or serial port interface.

It has a 33-MHz CPU that is based on Intel Corp.'s 486 chip. The Chameleon 600 will be available in April at a base price of $36,000, which includes all hardware and software.

Wandel & Goltermann will also expand its WAN analyzer capabilities at ComNet by adding support for the SMDS Data Exchange Interface (DXI) protocol decode to its DA-30 LAN/WAN analyzer.

This will enable the device to monitor traffic and analyze problems that occur between a router and a data service unit/channel service unit at speeds up to T-1.

With the SMDS DXI layer protocol package — which includes the SMDS Interface Protocol Level 3 and Local Management Interface protocol — loaded on the DA-30, users can view protocol-specific frame details and discover problems that would otherwise go undetected, such as routing problems, invalid IP addresses and physical link integrity breaks.

Previously, the DA-30 could only examine frame relay and High-Level Data Link Control packets.

Available this month, the DXI upgrade for the DA-30 costs $1,200.

Vendors expanding service to woo users

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mapping service simplifies network troubleshooting by establishing a model of a user's net that can be used to compare to current conditions, pinpointing areas where performance hits are occurring. This service will provide traffic pattern and bandwidth utilization analysis for each device on the net, which can be used to determine where new equipment is needed.

3Com will also work with users to make best use of their network budget. If a user wants to construct a Fiber Distributed Data Interface backbone, for example, and has a specified budget with which to do that, 3Com consultants can suggest various ways to accomplish the goal.

In terms of net maintenance, 3Com can either take full responsibility for the network or share responsibility with the user's internal staff.

Through the Professional Services Partner Program, 3Com also recommends channel partners, which consist of value-added resellers and third-party distributors, to design and implement network installations. These partners receive continuous training and up-to-date information from 3Com, which enables them to provide direct support to end users.

Independent study courses are also offered for both partners and end users in areas such as wide-area network connectivity, network architectures and internetwork protocol routing.

In conjunction with its service expansion, 3Com is establishing the Networking Technical Support Alliance (NTSA), which will work to develop a set of professional service performance standards designed to provide users with comprehensive networking support.

The NSTA, which is based on the technical Service Alliance initiated by Novell, Inc. in 1991, will have its first meeting on March 9 at INTEROP 93 Spring in Washington, D.C. Charter members include 3Com, Hewlett-Packard Co., IBM, Proteon, Inc., SynOptics, UB and Wellfleet Communications, Inc.

These companies have been focusing on the service end of their businesses during the last few months.

UB, which has been repositioning itself recently as a systems integrator, has formed an internal council for its users that attempts to foster quality improvements in its product and service lines by bringing users directly into the business development process.

According to Ralph Ungermann, president and chief executive officer at UB, the Customer Quality Council's mission is to innovate changes that will result in a high level of customer satisfaction. Council members take an active part in product testing and provide feedback on products under development.

The council complements UB's Access/Skills suite of network integration services that were announced at INTEROP last fall. Through that program, UB provides users with complete design, implementation and support of multivendor networks.

SynOptics also upgraded its service offerings recently by making up-to-date technical information and software upgrades more readily available through a variety of access methods, including telephone and on-site support, as well as CDROM and bulletin board services ("Link Notes," *NW,* Jan. 11).

"Users want a multivendor solution with single vendor service," said David Fowler, vice president of marketing for Chipcom Corp. "They're fed up with integrating Joe's hubs, Fred's routers, Mike's net management and Betsy's muxes. They want to concentrate on business goals, not network woes."

Network World
With Simmons.

OSIware to unveil X.400 products

continued from page 6

with TCP/IP will cost about $1,000 for a stand-alone copy and will ship in mid-February. A separate cost structure, which Chang declined to detail, will apply to local-area network configurations.

cc:Mail, Microsoft Mail gateways

Also at ComNet, OSIware will unveil Unix-based X.400 gateways for cc:Mail and Microsoft Mail that can work with versions of Unix from The Santa Cruz Operation, Inc. (SCO), Sun Microsystems, Inc. and Tandem Computers, Inc. The Unix-based gateways are designed to overcome the bottlenecks in gateway conversions that customers have complained about on slower processors, Chang said.

The SCO Unix version will cost $6,000, the Sun SPARCstation version will be priced at $8,000, and the Tandem version will be tagged at $12,000 per machine. Messenger 400 Gateway to cc:Mail will ship mid-February, and the Microsoft Mail version will be released in mid-March.

Network Systems reveals ATM plan

continued from page 4

3 High Speed Serial Interface that supports frame relay and Switched Multimegabit Data Service traffic at speeds up to 52M bit/sec.

With ATM coming on strong — at least in the arena of public perception — high-end router vendors are feverishly working to craft a role for their routers in evolving ATM networks.

NSC's plan, which will be implemented in four phases over the next two years, begins with the rollout of an ATM interface for its routers and ends with delivery of the Enterprise Router/Switch.

"Our goal is to support users' local- and wide-area routing and ATM requirements in a single device," said Mark Cree, NSC's product marketing manager. "With the new switch, the LAN and WAN will really be a single type of logical connection."

In Phase 1, NSC will outfit its 6400 and 6800 routers with an ATM interface that will support Synchronous Optical Network (SONET) Optical Carrier (OC)-1 speeds up to 52M bit/sec.

The interface will provide a link to an external Digital Link Corp. 3200/A data service unit (DSU) that will segment LAN packets into 53-byte cells before passing them off to an ATM net.

The new interface is scheduled to be delivered by next month.

In Phase 2, NSC will replace the DSU with a native SONET OC-3 ATM interface supporting speeds up to 155M bit/sec — a threefold performance boost. That interface is expected to be rolled out by the end of the year.

The first stages of the NSC strategy closely mirror those laid out last fall by Cisco Systems, Inc. and Wellfleet Communications, Inc. But NSC intends to make a more aggressive foray into the ATM market when it unveils by mid-1994 its Enterprise Router/Switch, which will provide integrated ATM switching and high-speed routing.

In addition to ATM, the router/switch will support direct connections of Ethernet, token-ring and FDDI LANs, as well as wide-area nets. Unlike a traditional router that has a shared-bus design, the NSC router/switch will directly switch all incoming traffic, boosting the performance of these so-called legacy shared media.

The final phase of NSC's ATM plan, to be completed in 1995, calls for improvements to the Enterprise Router/Switch.

UB bolsters line with router cards

continued from page 6

than 4,000 devices. When used to bridge, the module filters and forwards at 30,000 packet/sec, while a filtering/forwarding rate of 15,000 packet/sec is achieved during routing. Those rates, which are based on 64-byte packets, are expected to double when UB's fine-tuning is completed.

The FDDI module has a forwarding rate of 30,000 packet/sec when bridging and a 15,000 packet/sec rate during routing. It can filter 300,000 packet/sec and support both single- and dual-attached devices.

The modules both support the Transmission Control Protocol/Internet Protocol, Xerox Corp. Xerox Network Systems and Digital Equipment Corp. DECnet, as well as the Spanning Tree bridging protocol and the Point-to-Point Protocol (PPP), Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) routing protocols.

Systems Network Architecture support will be added in the future, said Elaine Jones, director of product marketing for UB's internetworking business unit.

Available now, the Ethernet module costs $8,500, while the FDDI version costs $16,000.

Spanning Tree support

The local bridge module, which supports the Spanning Tree Algorithm, can be configured for 4M or 16M bit/sec token ring and interconnect two same-speed token rings or a 4M and 16M token ring in applications such as terminal emulation and file transfer.

With a forwarding rate of 3,000 packet/sec, the bridge supports both shielded and unshielded twisted-pair wiring. Available now, it costs $3,900.

UB's remote bridge/router modules, also developed with ACC, are the Access/One Remote Ethernet Bridge/Router and the Access/One Remote Token Ring Bridge/Router.

Both modules support TCP/IP, DECnet, XNS, AppleTalk and Novell, Inc. Internetwork Packet Exchange (IPX), as well as the Spanning Tree Algorithm, PPP, RIP and OSPF. Wide-area network support includes T-1, fractional T-1, X.25 and frame relay via serial ports such as V.35, X.21, RS-232 and RS-449.

The remote Ethernet bridge, with one local-area network and one WAN interface, costs $7,600, while the remote token-ring version, which also supports one LAN and one WAN interface, costs $7,600. Both are available now.

Under its agreement with the company, UB will market Wellfleet bridge/routers, dubbed the Access/Node series, beginning in March. The deal represents the first fruit of a technology partnership between the two firms that was announced last April.

Former NET chief launches company

continued from page 4

PC in order to work on a file.

Smith calls SmartSync linkware because it provides a link between multiple PC files. Additionally, the product serves the extra-enterprise, which he described as the growing number of mobile and remote users needing connectivity to their home offices.

"Professionals have gotten used to using the applications available on their corporate networks and don't want to lose access to those applications every time they walk out the door," Smith said. "We're not necessarily looking at the real-time connectivity to these applications as others have, but rather the needs of the intermittent user."

SmartSync can synchronize data automatically at specified intervals, or synchronizations can be invoked manually, according to the firm.

SmartSync is designed to support both standard and cellular modems for wireline and wireless links. Nomadic has integrated a proprietary data compression technology to speed file transfers and cut costs.

SmartSync enables users to automatically update data across applications running on multiple Intel Corp. computers.

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The software has security capabilities, including passwords and encryption.

SmartSync will make its debut at this week's Demo 93: The Personal Computer Industry Product Review and Demonstration in Palm Springs, Calif. SmartSync is currently in beta test and will be available by midyear. Nomadic declined to provide pricing.

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NETWORK WORLD

Circle Reader Service #45

RND adds SDLC to bridge/router line, unveils SNMP Ethernet bridge

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — RAD Network Devices, Inc. (RND) this week will unveil at ComNet '93 in Washington, D.C. a new member of its bridge/router line that provides local support for Ethernet and Synchronous Data Link Control devices. RND will also unveil an Ethernet bridge that comes standard with support for the Simple Network Management Protocol.

RND's new Remote Ethernet Bridge (REB) has one Ethernet interface and can support direct attachment of SDLC devices, such as an IBM 3174 cluster controller. SDLC traffic is wrapped in RND Dynamic Shortest Path First (DSPF) routing frames for transmission across the internetwork.

Besides the Ethernet port, the bridge supports as many as four wide-area network interfaces — three of which can be configured as SDLC ports. The REB can also support SDLC multidrop lines, meaning a series of cluster controllers can be connected to the device via one link.

The REB supports Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. DECnet and Novell, Inc. Internetwork Packet Exchange (IPX), among other net protocols. The bridge also supports the source routing transparent bridging protocol and DSPF routing protocol.

It supports frame relay and X.21 WAN services via serial ports for RS-422, V.35 and T-1. REB filters 64-byte packets at 10,000 packet/sec and forwards 2,600 packet/sec.

Available now, the REB with the SDLC option ranges in price from $4,750 to $8,285, depending on configuration.

In the second announcement, RND's new stand-alone Local Ethernet Bridge (LEB), which is based on Intel Corp.'s i960 Reduced Instruction Set Computing processor, supports the Spanning Tree Protocol and has a forwarding rate of 14,500 packet/sec.

The device also includes an SNMP agent, allowing it to be managed by any third-party SNMP-based network management system, such as Hewlett-Packard Co.'s OpenView and SunConnect's SunNet Manager. It supports the SNMP Management Information Base (MIB) II and ANSI's bridge MIB.

The LEB is available now in two models. The version with two 10Base5 attachment unit interface (AUI) ports costs $1,495, and the model with two 10Base5 AUI ports and two 10Base-T ports is $1,695.

SMDS, FRAME RELAY, ATM.
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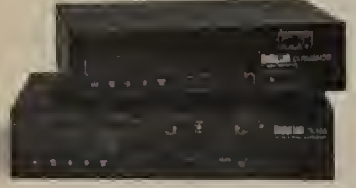

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Apple's on-again, off-again networking

continued from page 19

the cost for MacTCP and other products such as MacX that make the Macintosh better.

If Apple wants Macintoshes to be considered something special, it should exploit networking and provide MacTCP and ARA as part of the standard software distribution. It would cost Apple very little because the software could fit on the existing disk set, and it would keep the Macintosh in a class by itself.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Link Notes

continued from page 19

mote offices to enterprise nets over Integrated Services Digital Network Basic Rate Interface lines at speeds up to 12.8K bit/sec. It is available now for $1,690. The Everyware Dual/56 Bridge supports 10Base2 and 10Base-T Ethernet, and transmits data between remote local-area nets and corporate LANs over switched 56K bit/sec lines at speeds up to 11.2K bit/sec. Available in April, it costs $2,490.

The company also rolled out Connection Manager — a Windows-based net management package that manages Combinet's entire bridge line — and the Everyware IVP Toolkit, which facilitates interoperability between Combinet bridges and devices from other vendors. Connection Manager costs $895 and is available now. The tool kit is available now at no charge.

For more information, contact Combinet at (408) 522-9020.

Ethernet group lays course for future

continued from page 6

nications, Inc. camp is advocating that the MAC be retained.

Both sides were claiming victory after the two-day meeting, but straw votes taken on whether to preserve the MAC protocol indicate that many companies remain undecided. While the majority voted in favor of keeping the MAC — when polled as individuals and by company — a large number of abstentions highlighted the indecision.

3Com and SynOptics announced during the meeting that 14 other companies agreed that the MAC should be retained. Those firms included Cabletron Systems, Inc., Chipcom Corp., David Systems, Inc., Grand Junction Networks, Inc., IMC Networks Corp., Intel Corp., LAN Media Corp., Micro Linear Corp., National Semiconductor Corp., NCR Microelectronics Products Division, NetWorth, Inc., Racal-Datacom, Inc., Standard Microsystems Corp. and Sun Microsystems Computer Corp.

"The rapport established between companies that are natural competitors was exciting to see," said Doug Spreng, vice president and general manager of 3Com's Network Adapter Division. "It's gratifying to see everyone rally behind a common cause."

But Brice Clark, strategy and planning manager for HP's Roseville Networks Division, said the HP-AT&T group was pleased with reaction to its proposal. "Based on the [number of abstentions] in the straw vote, it appears we're very much in the running," he said. "Our presentation was well received, and we were pleased to see that the 100-meter distance and 802.3 frame size made the objective list."

That list contained 10 items the group decided should be part of the criteria for the new standard — dubbed Fast Ethernet — including 100M bit/sec speed, support for distances up to 100 meters, conformance with the Ethernet frame format, and support for major cabling types.

Peter Tarrant, chairman of the study group and director of connectivity products at SynOptics, was quick to point out that the meeting was not an us-vs.-them affair. "This was an extremely productive meeting, and it was very clear that the [vendors] want to move on this standard quickly," he said. ◻

Senior Writer Joanne Cummings contributed to this story.

IBM preps its OS/2 for client/server

continued from page 4

frames concurrently, up from one. As a server, it can provide a maximum of 254 sessions. Each OS/2 client can support 16 active 3270 or 5250 sessions, an increase from five.

Another new feature, First Failure Support Technology, lets Communications Manager/2 nodes automatically report status and other management data to LAN NetView manager or to the host NetView platform, giving users up-to-the-minute notice of failures. Previously, OS/2 nodes had to be polled for such data.

When IBM's Configuration, Installation and Distribution technology becomes available later this year, Communications Manager/2 will let users centrally update and distribute software to remote OS/2 nodes.

Leonard Thornton, a consulting micro engineer with Lithonia Lighting in Conyers, Ga. — a beta user of the new Communications Manager — added that it is easier to install than the old version. "The client/server version of the product will provide us with a cost-effective platform for developing, implementing and supporting new client/server applications without the overhead of our current configuration and support," he said.

Communications Manager/2 will be available March 26 for $474. It will sell for $1,995 per server plus $195 per client.

As expected, IBM also announced a 32-bit follow-on product to its existing 16-bit OS/2 Database Manager, DB2/2. The new version has closer ties to the host-based DB2 database, including support for the remote unit of work capability that lets it collect and update data from remote DB2 systems ("IBM preps to unveil 32-bit version of its OS/2 DBMS," *NW*, Jan. 25).

IBM also announced a 32-bit version of its host database access software, Distributed Database Connection Services/2 Version 2. It provides a direct LU 6.2 link between the OS/2 database and host DB2 databases, eliminating the need for special CICS software to act as a gateway between the two. Also available March 26, a DB2/2 single-user version will cost $425. A client/server version will be priced $2,495 per server plus $75 per client. Upgrading to DB2/2 client/server from OS/2 EE costs $1,495. ◻

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GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

Sprint Corp. last week said its business customers' average toll fraud loss in 1992 was $1,350, which the carrier says is 2.2% of the $60,000 average loss industrywide. The carrier credits its two new toll fraud monitoring services for keeping fraud losses down.

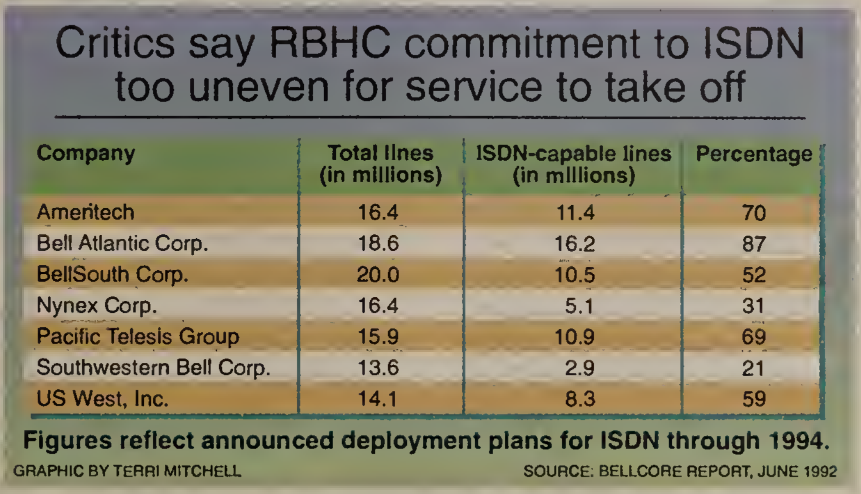
Regulatory Update

All long-distance carriers this week will be required to begin filing tariffs for their services, including custom net deals, unless the **Federal Communications Commission** takes legal action.

Last week, the U.S. Court of Appeals for the District of Columbia turned down a request from the FCC to reconsider its decision to overturn the agency's long-standing rule exempting nondominant carriers from tariff filing requirements ("Court bashes FCC on its tariff rules," *NW*, Nov. 23, 1992). A three-judge panel at the appeals court issued that ruling in November, but it has been held in suspension until the request for a rehearing is resolved.

The FCC's only option now is to appeal to the U.S. Supreme Court. If the Supreme Court agrees to hear the case, the FCC would likely be able to obtain a stay. However, if no stay is obtained, the appeals court's ruling becomes effective this week.

If the FCC is unsuccessful at bringing its case to the Supreme Court, the commission will either have to persuade Congress to rewrite the law to make its policies legal or force all carriers to file tariffs. ◻



Critics say RBHC commitment to ISDN too uneven for service to take off

Company	Total lines (in millions)	ISDN-capable lines (in millions)	Percentage
Ameritech	16.4	11.4	70
Bell Atlantic Corp.	18.6	16.2	87
BellSouth Corp.	20.0	10.5	52
Nynex Corp.	16.4	5.1	31
Pacific Telesis Group	15.9	10.9	69
Southwestern Bell Corp.	13.6	2.9	21
US West, Inc.	14.1	8.3	59

Figures reflect announced deployment plans for ISDN through 1994.

GRAPHIC BY TERRI MITCHELL SOURCE: BELLCORE REPORT, JUNE 1992

Legislators clash over plans for public switched net

Debate centers on need for fiber-optic network.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — President Bill Clinton has been in office little more than a week, and already the first clash over the future of the public switched network in the U.S. has erupted.

Last week, Sen. Conrad Burns (R-Mont.) addressed the Council on Competitiveness, saying a fiber-optic network that will handle various broadband voice and data applications for all users is critical to the future of businesses in the U.S.

Burns said he "watched in horror as gridlock, frustration and partisanship overtook the Congress," leading to the death of a bill he introduced that would have put in place a broadband fiber network by 2015.

But at the same time, another set of voices has emerged saying that if there is a technology problem holding back U.S. businesses, it isn't the lack of infrastructure but rather a lack of applications for the technology currently in the public network.

Focus on the present

At a hearing before the U.S. House Subcommittee on Telecommunications and Finance late last month, witnesses told Congress to forget pursuing futuristic network ideas and focus instead on making better use of the current network.

At that hearing, John Sculley, chairman of Apple Computer, Inc., told Congress that users will be best served by an incremental approach to building the network of the future rather than investing in a fiber-optic network. He suggested focusing on Integrated Services Digital Network, which he believes can support many of the voice and data needs of users today.

Mitch Kapor, cofounder of Lotus Development Corp., agreed. Because ISDN deployment is still so spotty, he said, it will be difficult to convince entrepreneurs to spend money to develop network applications. "There's a lot of unevenness in the availability and pricing of ISDN," Kapor said.

For example, Kapor said Bell Atlantic Corp. has been very aggressive in deploying ISDN and expects to have ISDN access available on 87% of its lines by 1994. But on the other hand, "US West, [Inc.] and Southwestern Bell [Corp.] are barely playing along at all," he said. By 1994, ISDN will be available on 59% of US West's lines, 21% of Southwestern Bell's and 31% of Nynex Corp.'s, Kapor said (see chart, this page).

With such disparity in ISDN deployment, "vendors [that could develop ISDN] applications aren't convinced that ISDN is really real," he said.

It is the applications, not the underlying facilities, that are most important to users, particularly residential customers, according to Kapor.

A little goes a long way

Although many observers predicted that the idea of a national fiber-optic network would gain steam because it has been a pet project of Vice President Al Gore for several years, a more limited idea such as that proposed by Sculley could have surprising success.

For one thing, as Burns pointed out, Congress has tended to be partisan and deadlocked on the issue of a national network facili-

(continued on page 27)

New WilTel offerings ease network mgmt.

Services give users the option of farming out operations or monitoring their systems in-house.

By Bob Wallace
Senior Editor

TULSA, Okla. — WilTel last week announced a suite of services under which it will build and manage networks for users as well as a new version of its management system that gives users improved performance monitoring capabilities.

The two announcements begin to position WilTel, the fourth largest private-line provider, as a carrier that can either design, build and manage user nets itself or give users the tools to do the job on their own.

The new value-added services, which come under the umbrella name of WilPower, include network design and testing, collocation, transmission services, delivery of customer premises equipment, local-area network/wide-area network design and network management.

Using WilPower, all WilTel business units can coordinate through a single point of contact to provide integrated technical and operating support.

Services can range from turnkey personal computer LAN design and installation to outsourcing of all telecommunications operations, including the purchase of the user's equipment and management of personnel.

WilPower also provides Full-Service Internetworking, featuring LAN internetwork implementation, management and operation of WilTel-provided WANs. This enables users to deploy private corporate internetworks without the expense of building, owning and operating the net.

The carrier has teamed with BBN Systems & Technologies to offer Full-Service Internetworking. The duo will plan, own, operate and expand LAN internets for users. Standard service supports Transmission Control Protocol/Internet Protocol, Novell, Inc. Internetwork Packet Exchange (IPX), DECnet and AppleTalk, with Systems Network Architecture available as an option.

(continued on page 26)

Int'l carriers intro backup service for Pac Rim links

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week said it has partnered with eight other carriers that serve users in the Asia/Pacific region to provide an automatic restoration service for backing up dedicated international links.

The new service uses a customer premises-based device on each end of a global link to reroute traffic from failed links to international switched services until the original route is brought back on-line.

The service was developed by AT&T, the International Telecommunications Administration of Taiwan, Kokusai Denshin Denwa Company, Ltd. of Japan, Korea Telecom, OTC, Ltd. of Australia, Philippine Long Distance Telephone Company, Singapore Telecom, Syarikat Telecom Malaysia Berhad of Malaysia and Telecom Networks & International, Ltd. of New Zealand International.

"Our customers have told us they want more reliable international services as well as [customizable] service guarantees," said George Schaefer, a district manager with AT&T's Business Communications Services group. "We think we have a brand-new and innovative approach to addressing their needs."

The service will initially enable carriers to reroute both 56K and 64K bit/sec links — the most heavily used international links — and will eventually be enhanced to support backup of much higher speed lines.

Multinationals will need a special multiplexer-like device called an automatic restoration unit

(continued on page 26)

PacBell $1b switch plan mapped out

By Bob Wallace
Senior Editor

SAN FRANCISCO — Pacific Bell last week announced a $1 billion analog central office switch replacement plan that will let the company provide digital Centrex, Integrated Services Digital Network and Custom Local Area Signaling Services (CLASS).

The Bell operating company plan calls for the retirement of all analog switches, which currently serve the bulk of California's businesses and residential customers — eight million of the state's 14 million lines.

The new switches — AT&T Network Systems 5ESS and Northern Telecom, Inc. DMS-100 digital central office switches — will support 9.1 million lines when the project is completed sometime in 1997.

"Modern telecommunications is vital to the prosperity and well-being of Californians," said Phil Quigley, president of Pacific Bell. "It is a critical part of the economic and social framework that determines the quality of everything from our industry to our schools to our air."

The new switches will pave the way for the delivery of CLASS services, such as priority ringing, select call forwarding, repeat dialing, call trace, call screen and call return, as well as digital Centrex and Centrex Integrated Systems, which is ISDN Centrex.

The digital switching platform will also enable Pacific Bell to more widely deploy its Switched Digital 56 service and its Message Center automated phone-answering service.

Pacific Bell said when the project is completed, AT&T and Northern Telecom digital switches will serve roughly equal portions of its network. The $1 billion also covers installation and support services.

The carrier will realize substantial savings by reducing the type of switches they use throughout California, said a Pacific Bell spokesman.

The carrier said the decision to deploy the new switches was made after a study indicated it was more sensible to replace the analog switches than upgrade them. ◘

WilTel offerings ease net mgmt.

continued from page 25

"No carrier has as broad and as clearly defined an offering as WilTel's WilPower," said Chris Finn, an associate with Tele-Choice, Inc., a Montclair, N.J., consultancy. "Some other carriers offer a variety of these services but not the entire package."

For users wanting to control and manage their WANs themselves, WilTel offers its WilTel WilView 2.0 network management system, which is software that runs on a host at WilTel's operations center here.

To employ the service, users must have Simple Network Management Protocol-based or proprietary net management stations supporting the X/Window System standard and TCP/IP.

The user must establish a 56K bit/sec digital data service or WilPak public frame relay link between its management workstation and WilTel's host. The carrier is working toward enabling dial-up links.

With WilView 2.0, users can click on WAN links and see a display of the geographical routing for each WilTel circuit, enabling them to plan route diversity.

Customers can also for the first time use WilView 2.0 to access data collected by the carrier's internal T-1 and T-3 performance monitoring systems in near real time, enabling them to identify circuit degradation problems before they become critical. WilView also now supports the creation of trouble-area reports.

Since its initial availability in early 1992, WilView has provided customers access to data on a range of services such as circuit inventory, routing and performance data, as well as service order and trouble-ticket status. ◘

Carriers intro backup service

continued from page 25

(ARU) at each end of the international link to use the new service, Schaefer said. AT&T has worked with Republic Telecom to develop the ARU.

The ARU can detect failures on a user's end-to-end fiber or satellite link, including those on switched or dedicated local loops.

In the event of a failure, it forges a new link to the remote site using a terminal adapter/rate adaptation unit and AT&T's Integrated Services Digital Network or Switched Digital International network.

The ARU continues to monitor the failed link and switches back to that connection once it is back on-line.

After traffic is sent over a backup link, the ARU sends alarm messages through a modem at the customer site to the carrier's international transmission maintenance center, where a trouble ticket is automatically opened.

Pricing for the backup service will vary by carrier and country. AT&T has not yet finalized pricing for the new AT&T service but did say users would pay a premium for it, Schaefer said. Still, the service would be less expensive than a dedicated backup link, he said.

The service is expected to be available in the second quarter for links between the U.S, Australia, Japan, New Zealand and Singapore. It will be expanded to include the remaining international carriers later this year and into 1994. ◘

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Circle Reader Service #22

CDROM-based system to ease info access at FCC

By Daniel Briere
Contributing Editor

The Federal Communications Commission is installing new CDROM-based systems to ease the storage and retrieval of tariff information in its Tariff Division's public reference rooms.

Starting in the third week of February, FCC staffers and the general public can start sifting through the reams of on-line tariff filings.

"Our new system will allow us to massage the data any way we like," said Cathy Fegan, acting deputy for reference operations at the FCC. "The timeliness and flexibility in retrieval mode make CDROM the logical long-term solution. We hope to eventually have it on a network accessible by other bureaus, too."

The FCC is just one of many organizations using TelView, the optical system for data storage and retrieval applications from Communications Image Technologies, Inc. (CITI). CITI has also signed up carriers such as AT&T, MCI Communications Corp., Cable & Wireless Communications, Inc., Long Distance Discount Service, Metropolitan Fiber Systems, Inc., NEC America, Inc., Sprint Corp. and Teleport Communications Group, Inc., as well as end users and consultants such as Mitre Corp., Centex Telemanagement and San Francisco Consulting Group.

The FCC's move to TelView was prompted by a U.S. Court of Appeals ruling late last year forcing carriers to file more detailed information on all customer rate plans. "The FCC does not have the place, time, budget, people or desire to handle this amount of paper," said Ken Shafer Jr., president of CITI.

TelView offers access to scanned images of more than 1,300 current tariffs on 12 compact discs. "It is the actual tariff, not a summary," he said. "What's more, getting old transmittals is as easy as putting in a CD."

One TelView CDROM disk can store images of more than 24,000 pages of tariff information, enough to fill a shelf eight feet wide in diameter. On one disk, for instance, CITI has tariffs for all Allnet Communication Services, Inc., AT&T, Cable & Wireless, MCI, Metromedia Long Distance, Sprint, WilTel and World Communications, Inc. services — 50 tariffs in all.

Weekly updates provide the user with new filings regularly, and a completely new library is shipped once a month.

"We did not keep a paper-based library before because it was too voluminous and manpower-intensive," said David Garbin, a principal engineer at Mitre in McLean, Va. "Also, historical data is generally not available. The CDROM system gives us access to current and historical tariff data with a minimum expenditure of man power."

TelView was developed for the Microsoft Corp. Windows environment and operates best with a 386 or 486 personal computer with at least a super VGA monitor.

Costs vary according to the tariffs received, about $150 per year per tariff for the interexchange carriers, which is similar to paper-based rates. There is also a range of volume and term discounts available as well as a minimum cost of $1,750 per year per customer. ◘

Legislators clash over net plans

continued from page 25

ty to support high-bandwidth services to business. In many ways, that debate has gotten tied up with the regional Bell holding companies' efforts to get into currently prohibited business areas. The RBHCs say that without the ability to develop software, equipment and services to ride on top of the network, the huge investment in a broadband facility doesn't make sense.

The second reason lawmakers may agree to scale back is cost. Last week, Sculley said it would likely cost between $25 billion and $30 billion to deploy a nationwide fiber net. Other estimates have ranged into the hundreds of billions of dollars.

This project is not the only infrastructure issue competing for tax dollars.

GAO findings

In a transition report outlining critical areas requiring new administration action, the General Accounting Office (GAO) said there are serious deficiencies in many of the nation's basic technology systems supporting critical services.

According to the GAO, at least $7.4 billion must be spent to overhaul the computer and communications systems at the National Institute of Standards and Technology, the National Weather Service and the U.S. Patent and Trademark Office.

The Department of Commerce, which oversees these areas, has admitted that due to the outdated and overloaded computer and communications systems, those agencies are particularly vulnerable to fraud, waste and mismanagement.

"Commerce has characterized the systems as archaic, unable to produce reliable information, inadequately controlled and often not used by managers," the GAO report said.

Computer and communications systems at most national agencies, not just the Commerce Department, are in dire need of funding, according to the GAO. In addition, it said the government will need to spend $250 billion over the next six years just to maintain the nation's highways and bridges at 1989-quality levels. To fund improvements to the highway system, the government will have to spend a staggering $425 billion over the next six years. ◘

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Worth Noting

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> **Chuck Digate**
> President
> Beyond, Inc.
> Cambridge, Mass.

Store & Forward

Natural Language, Inc. of Berkeley, Calif., today began shipping Microsoft Corp. Windows-based software that allows users to type ad hoc English queries to extract data from SQL databases.

Called Natural Language for Microsoft Windows, the software recognizes more than 100,000 English words and concepts, and allows users to extract data from Oracle Corp. and Sybase, Inc. relational databases.

The software, which costs $595, will also support Informix, Inc. and Ingres Corp. relational databases by the end of the second quarter. It also runs on Unix and Digital Equipment Corp. VAX/VMS platforms.

The Bristol Group of Larkspur, Calif., last week announced work group software for Unix machines.

Called POwerBase/Workgroup, the client/server software enables a network of Unix users to maintain personal and shared directories of contact names, among other things. It runs on Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co. 9000 and IBM RS/600 workstations and supports the Motif and OpenLook graphical user interfaces. A single user license costs $395, and a server license is priced at $995.

(continued on page 31)

SQL Access Group

Founded:	1989
Mission:	Promote interoperability of SQL DBMSs
Task:	Develop specifications based on existing SQL standards that provide a uniform way for applications to access data from multivendor DBMSs
Members:	41 systems and software vendors, including Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: SOL ACCESS GROUP, MANCHESTER, N.H.

SQL Access Group plots new course for year ahead

Next step is to distribute SQL specifications.

By Wayne Eckerson
Senior Editor

Not content to rest on its technical laurels, the SQL Access Group (SAG) will focus its efforts for the next two years on ensuring widespread adoption of its standards for accessing SQL databases.

During the next 18 months, SAG expects to roll out programs for distributing copies of its SQL specifications and evaluating vendor products for conformance to those specifications, according to SAG Chairman Jeffrey Balboni, a technical consultant at Digital Equipment Corp. in Nashua, N.H.

> "Now we need to refocus our mission to make sure the SAG specifications are used widely," Balboni said.
>
> ▲▲▲

"SAG has done an exceptional job assembling experts and producing technology that is useful," he said. "Now we need to refocus our mission to make sure the SAG specifications are used widely."

Founded in 1989, SAG is a consortium of 41 software vendors, including DEC and IBM, that meet regularly to develop industry standards for SQL technology.

Several SAG specifications, including its Call-Level Interface (CLI) and Formats and Protocols (FAP), were recently accepted for evaluation by ANSI and the International Standards Organization.

SAG's CLI is an application program interface (API) that enables developers to link applications to SQL databases. FAP is an interface to transport-level protocols that enables SQL messages to be sent and received across a network.

"The SAG CLI and FAP are well on their way to becoming international standards," Balboni said.

In order to ensure the interoperability of SAG-compliant products, the group is considering implementing a Vendor Technology Reference program in which vendors would voluntarily submit products for evaluation. Products complying with SAG specifications would be posted in a free list, showing users which SQL products interoperate, he said.

According to Balboni, SAG will probably implement the Vendor Technology Reference program later this year. The group still has to iron out some details, including how to resolve problems that arise when two SAG-compliant products fail to interoperate.

Standard availability

In another effort to disseminate SAG standards, the group recently implemented a Specification Distribution program that allows users to purchase copies of SAG specifications via telephone or facsimile. For about $50, users can obtain copies of SAG's CLI, FAP and SQL specifications. The SQL specification defines an SQL syntax supported by all vendors.

To obtain a specification, users can write to SAG at P.O. Box 5599, Manchester, N.H. 03108,

(continued on page 32)

cc:Mail gets in sync with new releases

Features will include enhanced bulletin boards, spell checkers; Motif version of cc:Mail to come.

By Wayne Eckerson
Senior Editor

MOUNTAIN VIEW, Calif. — An official from Lotus Development Corp.'s cc:Mail division recently detailed a dozen new features that will be implemented simultaneously across all cc:Mail platforms late this year.

Chuck Stegman, product manager for cc:Mail based here, said Lotus will release concurrently in the fourth quarter cc:Mail for Windows 3.0, cc:Mail for Macintosh 3.0, cc:Mail for DOS 5.0, cc:Mail for OS/2 2.0 Workplace Shell and cc:Mail for Unix 2.0.

The new features range from spell checkers and enhanced bulletin boards to simplified methods for shutting down post offices in case of a system or network failure.

Separately, Lotus officials confirmed that the company is developing a Motif version of cc:Mail that runs on IBM's AIX, Hewlett-Packard Co.'s HP-UX and Sun Microsystems, Inc.'s Solaris 2.0 platforms. The current version of cc:Mail for Unix uses Sun's OpenLook graphical user interface and runs on Solaris 2.0.

The concurrent release — dubbed as Sequoia — is part of Lotus' ongoing effort to increase the number of features that all cc:Mail products have in common, Stegman said.

New features such as hierarchical folders and bulletin boards must be added to all platforms at the same time or they will not work properly, Stegman said.

(continued on page 30)

Seeking synchronicity

These new features will be implemented simultaneously in all cc:Mail platforms in the 4th quarter:

- Personal directories
- Work flow forms
- Administrator-defined fields
- Local, draft and trash folder enhancements
- Hierarchical directory views
- Hierarchical folders and bulletin board
- Nonunique name handling enhancements
- Improved aliases
- Spell checker
- Auto forward and reply
- Simplified post office shutdown
- Enhanced bulletin boards

SOURCE: LOTUS DEVELOPMENT CORP.,
MOUNTAIN VIEW, CALIF.
GRAPHIC BY TERRI MITCHELL

PacBell informs, trains staff with kiosk system

By Timothy O'Brien
West Coast Bureau Chief

SAN RAMON, Calif. — With more than 50,000 employees, Pacific Bell needed to find an effective new way to communicate critical company policies internally. Publishing another newsletter just wasn't going to do.

Instead, the giant telecommunications service provider developed the Employee Knowledge Link (EKL), an on-line Unix-based multimedia training program that uses Integrated Services Digital Network to connect hundreds of client workstations in kiosks throughout its California offices.

The company expects the new system to increase training productivity for programs covering mandatory policies, keep its employees better informed about changing regulations and save approximately $18 million over the next six years by reducing employee work time.

"Getting important information to over 50,000 employees is a huge task, but we've made it much easier by creating EKL," said Jack Fine, Pacific Bell's EKL project manager. "Because it's interactive and interesting, it's saving valuable time for our employees and managers, and that translates into saving money."

Pacific Bell developed the system using a network-based multimedia product called Momentum from Gain Technology, which was recently acquired by data-

(continued on page 32)

OMG issues RFI for its upcoming CORBA version

By Wayne Eckerson
Senior Editor

FRAMINGHAM, Mass. — The Object Management Group (OMG) last week issued a formal request for information (RFI) about how to enhance and broaden the Common Object Request Broker Architecture (CORBA) to support distributed object computing.

The RFI will enable OMG, a consortium of almost 300 vendors that is based here, to determine what technologies need to be included in Version 2.0 of CORBA.

CORBA is a message-handling vehicle that enables objects to make and receive requests and responses in a distributed computing environment. Objects are pieces of data and associated code that represent distinct functions within an application.

CORBA is a fundamental component of OMG's Object Management Architecture, which defines the primary parts of an object-oriented computing environment and the interfaces between them.

Request for proposal

The OMG last week also issued a request for proposal for technologies that would map C++ calls to OMG's Interface Definition Language (IDL). IDL, which is based on the C programming language, was created to provide a clear description of the interface to CORBA, according to John Slitz, marketing manager for OMG in Boulder, Colo.

HyperDesk Corp. and Digital Equipment Corp. have already shipped CORBA-conformant communications products, while Hewlett-Packard Co., Sun Microsystems, Inc. and others will soon release products.

Also, more than 60 software developers have stated that they are building CORBA-compliant applications, Slitz said.

The OMG is open to all ideas about how to enhance CORBA, but it has some areas of special interest, including improving the interface to CORBA for obtaining repository information and mapping various programming languages to IDL, Slitz said.

OMG will sift through suggestions and issue an RFP this fall for specific technologies it will bundle into CORBA. Version 2.0 will probably be available some time in 1994, Slitz said. ◘

cc:Mail gets in sync with new releases

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Maria LaMorte, manager of electronic mail systems at EMI Music in New York, said the synchronous upgrade is critical for her company because it is migrating from cc:Mail for DOS to cc:Mail for Windows.

"Currently, we have to spend additional money and time training and supporting end users because the two products don't share many of the same features," she said.

> Discretionary bulletin boards will give users the option of whether to receive posted messages.
>
> ▲▲▲

The following new features will be available across all cc:Mail platforms later this year:

- Personal directories will let users create directories that only they will use and maintain.
- Administrator-defined fields will allow administrators to add extra fields in a directory for such things as telephone numbers, departments and job responsibilities.
- Enhancements to local folders, draft folders and trash folders will improve the ability to store and delete messages.
- Hierarchical directory view will let administrators create multiple, hierarchical views of a directory to help users locate individuals.
- Nonunique name handling will make it easier for companies to distinguish individuals with the same name.
- Auto forward and reply will allow users to forward incoming messages to others or automatically send a predefined reply.
- Discretionary bulletin boards will give users the option of whether to receive posted messages. ◘

▼ TOTAL OUTSOURCING ▼ KEY SYSTEMS ▼ DATA COMMUNICATIONS EQUIPMENT ▼ PBX EQUIPMENT ▼ VOICE PROCESSING SYSTEM

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Uniface client/server tool gives users access to IBM DB2 databases

By Timothy O'Brien
West Coast Bureau Chief

ALAMEDA, Calif. — Uniface Corp. last week announced an interface that will enable programmers to use its client/server application development tool to provide access to IBM DB2 databases.

The Uniface MDI/DB2 Interface gives client/server applications full read/write access to DB2 data through a link to Micro Decisionware, Inc.'s (MDI) Database Gateway.

"As organizations develop new client/server applications, vast amounts of mission-critical data remain in mainframe DB2 databases," said Anu Shukla, vice president of marketing at Uniface. "Uniface now gives companies the tools to bring corporate information to the desktop."

Uniface is a cross-platform, fourth-generation-language, client/server application development tool that allows developers to create applications that are both platform- and database-independent.

On the server side, Uniface lets programmers create applications capable of simultaneously retrieving data from heterogeneous databases while at the same time maintaining the integrity of the shared information.

Uniface also includes the Universal Presentation Interface, which allows a single application to transparently support different types of clients, including character-based terminals, Microsoft Corp.'s Windows, OS/2, Unix and Apple Computer, Inc.'s Macintosh.

In both its development role and in its run-time implementation, the Uniface MDI/DB2 Interface runs on each client workstation and uses the Named Pipes protocol to communicate with the OS/2 MDI Database Gateway communications server. In order to operate, the MDI Database Gateway also requires MDI CICS-DB2 software to be running on the mainframe.

To access DB2 data, a Uniface client/server application makes a request that is translated at the client into native DB2 SQL by the interface software. The request is routed to the MDI Database Gateway, which then forwards it to the host.

Minimizing the burden

Uniface chose to handle the translation of application requests to DB2 SQL with its interface software — rather than through the MDI Database Gateway — in order to minimize any performance burden on the gateway. The company thought this feature was necessary to accommodate the high-throughput demands of on-line transaction processing applications.

Rick Patch, president of Micro Decisionware, pointed out that Uniface's strength is that it provides support for the full feature set of every database it supports.

"By integrating its product with the MDI Database Gateway, Uniface now gives its customers full access to DB2 while maintaining complete interoperability with other popular databases," he said.

The Uniface MDI/DB2 Interface is priced at $1,130 for the developers' version and $400 for the run-time version. Availability is set for April.

Store & Forward

continued from page 29

Tandem Computers, Inc. last week shipped a tool kit that enables developers to build Microsoft Corp. Windows-based on-line transaction processing (OLTP) applications. The tool kit contains two products — the Pathway Open Environment Toolkit and the Tandem Dynamic Data Exchange Gateway — that make it easier and faster for developers to build Windows-based OLTP applications for Tandem NonStop processors. It also contains the Remote Server Call (RSC), an application program interface that connects Windows applications across a network to Pathway, Tandem's transaction processing monitor. RSC supports various network protocols, including Network Basic I/O System, Transmission Control Protocol/Internet Protocol and X.25.

Ingres, an ASK company, last week announced a seven-level support and service program in North America that enables customers to select the optimal level of support for their computing environments. Users can now choose support plans that range from on-line assistance to account teams and on-site visitations.

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Circle Reader Service #13

PacBell trains staff with kiosk system

continued from page 29

base vendor Sybase, Inc. and now operates as a wholly owned Sybase subsidiary.

The EKL application runs on a Sun Microsystems, Inc. server in the company's headquarters here, and multimedia data and images are distributed via ISDN facilities to Sun workstations in the training kiosks.

In order to access the EKL application and its multimedia database on the server, a small run-time component of the application and the Momentum software reside at the client workstations.

Employees use the kiosks to obtain the information they need at their own convenience and at their own pace. In addition, the system automatically logs usage, minimizing the managerial burden of ensuring that the data is distributed.

The EKL system was developed out of a need to keep employees better informed about critical information ranging from policies on the handling of confidential customer information and telephone numbers to public utility commission regulations.

Before the system was developed, communicating this information companywide was difficult and expensive. To ensure that it was being disseminated effectively, managers at Pacific Bell had to spend considerable time tracking which employees had covered which topics.

As a result, some managers spent almost half of their time tracking employee training. Pacific Bell estimated that it was spending $5.7 million per year in employee time to communicate these basic policies and information throughout the company.

By turning to the Momentum system, Pacific Bell was able to create an interactive multimedia training program that uses sound and animation, as well as the more traditional text and graphics.

Since new information could be made available immediately by updating Momentum's database, Pacific Bell decided that an on-line Momentum system would be more effective and could be kept more up-to-date than CDROM or video releases of the same information.

"We wanted to use sound and animation so it would be exciting, fast-paced and keep people's attention," said Ann Dease, a Pacific Bell computer specialist who worked on the project. "We wanted a system that employees could interact with rather than just sit passively in front of."

> Employees use the kiosks to obtain the information they need at their own convenience.
>
> ▲▲▲

EKL's interactive design has made the information presentation more interesting than manuals, videos or newsletters.

This year, Pacific Bell will add more kiosks and material to the subjects on the EKL system. Also, the company will extend access to the system to employees' desktops.

Pacific Bell's Fine said he believes that applications such as EKL will usher in a new era of internal communications at the company. "The EKL system has transformed the coverage of mandatory information from a burden to a pleasure," he said. ◻

SQL Access Group plots course for 1993

continued from page 29

fax a request to (603) 437-1548 or call and leave a message at (603) 434-0802. The specifications are published by X/Open Company, Ltd., which reviews and publishes SAG technology, Balboni said.

Other priorities

Other SAG goals this year include increasing the number of European members and starting a user council, which will provide users with a voice to express their needs and requirements to SQL access vendors.

SAG also plans this spring to ship a version of the ISO Remote Database Access standard that runs over the Transmission Control Protocol/Internet Protocol. The current version runs across Open Systems Interconnection protocols only.

Balboni said he also anticipates that SAG will begin merging various competing SQL access specifications into SAG's CLI, specifically Borland International, Inc.'s Integrated Database API and Microsoft Corp.'s Open Database Connectivity. ◻

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1 Industry: (check one only)

01. ☐ Manufacturers (other than Computer/Communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade/Business Services
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
13. ☐ Government, State/Local
14. ☐ Government, Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (Independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/VAN/ Systems Houses
22. ☐ Distributors, Computer Related
23. ☐ Distributors, Communications Related
24. ☐ Other______________________

2 Whet is your job function? (check one only)

NETWORKING MANAGEMENT
1. ☐ Networking Mgmt.
2. ☐ LAN Mgmt.
3. ☐ Datacom/Telecom Mgmt.
4. ☐ Engineering Mgmt.

MIS MANAGEMENT
5. ☐ MIS, IS, IT Mgmt.
6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT
7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)

8. ☐ Consultant (Independent)

9. ☐ Other______________________

3 My responsibilities include: (check one only)

1. ☐ LANs/ Internetworking/ WANs
2. ☐ LANs/ Internetworking
3. ☐ LANs
4. ☐ WANs
5. ☐ None

4 Whet is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9.
6. ☐ 1
7. ☐ None

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope
(check one only)
1. ☐ Corporatewide
2. ☐ Multienterprise (consultants)
3. ☐ Departmental

B. Involvement
(check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate

4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

Involved / Plan to Purchase

A B LOCAL-AREA NETWORKS
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ LAN Servers
☐ 03. ☐ LAN Operating Systems Software
☐ 04. ☐ Superservers
☐ 05. ☐ Data Base Servers (Oracle, Sybase, etc).
☐ 06. ☐ Terminal Servers
☐ 07. ☐ LAN Services
☐ 08. ☐ LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
☐ 09. ☐ Network Test Equipment
☐ 10. ☐ Hubs
☐ 11. ☐ Cables, Connectors, Baluns
☐ 12. ☐ UPS
☐ 13. ☐ Network Adapter Boards
☐ 14. ☐ Peer-to-Peer LANs
☐ 15. ☐ Wireless LANs
☐ 16. ☐ SNMP Network Management
☐ 17. ☐ ATM (Asynchronous Transfer Mode)

A B INTERNETWORKING
☐ 18. ☐ Bridges
☐ 19. ☐ Routers
☐ 20. ☐ Gateways
☐ 21. ☐ Bridge/Routers
☐ 22. ☐ Hubs
☐ 23. ☐ Intelligent Hubs
☐ 24. ☐ Communications Servers

Involved / Plan to Purchase

A B COMPUTERS/PERIPHERALS
☐ 25. ☐ Micros/PCs
☐ 26. ☐ Minis
☐ 27. ☐ Mainframes
☐ 28. ☐ Pen-Based
☐ 29. ☐ Laptops
☐ 30. ☐ Workstations
☐ 31. ☐ Image Processing Workstations
☐ 32. ☐ Front-End Processors
☐ 33. ☐ Terminals
☐ 34. ☐ Printers
☐ 35. ☐ Cluster Controllers
☐ 36. ☐ Fax Machines
☐ 37. ☐ X-Terminals

A B SOFTWARE/APPLICATIONS
☐ 38. ☐ Network Management
☐ 39. ☐ Micro to Mainframe
☐ 40. ☐ Security
☐ 41. ☐ Communication/Terminal Emulation
☐ 42. ☐ Word Processing
☐ 43. ☐ Operating Systems
☐ 44. ☐ Business Applications (Finance/Mfg/HR)
☐ 45. ☐ Applications Development
☐ 46. ☐ Data Base Management
☐ 47. ☐ Spreadsheet
☐ 48. ☐ Groupware
☐ 49. ☐ EDI
☐ 50. ☐ E-Mail
☐ 51. ☐ Windows/Graphical User Interface
☐ 52. ☐ 4GL/Development
☐ 53. ☐ Multimedia
☐ 54. ☐ Graphics
☐ 55. ☐ Utilities

A B WIDE-AREA NETWORK EQUIPMENT/SERVICES
☐ 56. ☐ Modems (9.6K bps and over)
☐ 57. ☐ Modems (under 9.6K bps)
☐ 58. ☐ T-1
☐ 59. ☐ T-3
☐ 60. ☐ Fractional T-1
☐ 61. ☐ Data Switches
☐ 62. ☐ SMDS
☐ 63. ☐ ATM (Asynchronous Transfer Mode)
☐ 64. ☐ Matrix Switches
☐ 65. ☐ Packet Switches
☐ 66. ☐ Protocol Converters
☐ 67. ☐ Diagnostic/Test Equipment
☐ 68. ☐ DSU/CSUs
☐ 69. ☐ Microwave
☐ 70. ☐ Fax Boards/Modems
☐ 71. ☐ VSAT
☐ 72. ☐ Fiber Optic
☐ 73. ☐ Satellite
☐ 74. ☐ ISDN
☐ 75. ☐ PBXs (over 1000 lines)
☐ 76. ☐ PBXs (under 1000 lines)
☐ 77. ☐ Automatic Call Distributors
☐ 78. ☐ Voice Messaging Systems
☐ 79. ☐ Videoconferencing Systems
☐ 80. ☐ Voice Response/Processing
☐ 81. ☐ Switched Voice
☐ 82. ☐ Dedicated Leased Line
☐ 83. ☐ Switched Data
☐ 84. ☐ Centrex
☐ 85. ☐ E-Mail/On-Line Information
☐ 86. ☐ Image Processing
☐ 87. ☐ Audio Teleconferencing
☐ 88. ☐ Local Services
☐ 89. ☐ WATS MTs
☐ 90. ☐ International
☐ 91. ☐ Virtual Networks
☐ 92. ☐ Frame Relay
☐ 93. ☐ Value Added Services
☐ XX ☐ None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	LANs A		Workstations/ Nodes B
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or Less	☐

8 Which of the following network platforms are currently instelled/planned in the next year?

NETWORK ARCHITECTURES
Present Planned
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25

Present Planned
☐ 07. ☐ NOVELL IPX/SPX
☐ 08. ☐ APPC/APPN/LU 6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ OTHER______________________

LAN OPERATING SYSTEM
☐ 13. ☐ LOCALTALK (APPLETALK)
☐ 14. ☐ BANYAN (VINES)
☐ 15. ☐ DCA (IRMALAN)
☐ 16. ☐ DCA (10-NET)
☐ 17. ☐ IBM (LAN SERVER)
☐ 18. ☐ IBM (PC LAN PROGRAM)
☐ 19. ☐ MICROSOFT (LAN MANAGER)
☐ 20. ☐ UNGERMANN-BASS (NET/1)
☐ 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
☐ 22. ☐ PROTEON (PRONET)
☐ 23. ☐ SITKA (TOPS)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ OTHER______________________

LAN ENVIRONMENT
☐ 29. ☐ 4M TOKEN RING
☐ 30. ☐ 16M TOKEN RING
☐ 31. ☐ ARCNET
☐ 32. ☐ ETHERNET
☐ 33. ☐ STARLAN
☐ 34. ☐ FDDI
☐ 35. ☐ LOCALTALK
☐ 36. ☐ 10BASE-T
☐ 37. ☐ OTHER______________________

OPERATING SYSTEM
☐ 38. ☐ DOS
☐ 39. ☐ UNIX/XENIX/AIX
☐ 40. ☐ OS/2
☐ 41. ☐ OS/2 2.X
☐ 42. ☐ MVS
☐ 43. ☐ VM
☐ 44. ☐ VMS
☐ 45. ☐ MACINTOSH
☐ 46. ☐ WINDOWS
N/A 47. ☐ WINDOWS NT
☐ 48. ☐ X WINDOWS
☐ 49. ☐ OTHER______________________

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

10 Which of the following herdware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER__________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A		B	
☐	1.	☐	$100 million and over
☐	2.	☐	$50 - $99.9 million
☐	3.	☐	$25 - $49.9 million
☐	4.	☐	$20 - $24.9 million
☐	5.	☐	$10 - $19.9 million
☐	6.	☐	$5 - $9.9 million
☐	7.	☐	$1 - $4.9 million
☐	8.	☐	$500,000 - $999,999
☐	9.	☐	$499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ $1 to $9.9 billion
3. ☐ $500 to $999.9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million
8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

The videoconferencing industry's "growth is being driven most dramatically by inter-organizational, international and multipoint videoconferences."

Doug Robertson
Vice president of marketing
VideoBooth, Inc.
Chicago

People & Positions

Tom Pickren last week was named to the newly created position of director of network professional services at **Cascade Communications Corp.**, a Westford, Mass., frame relay switch vendor. He will be responsible for developing a customer support group to provide training and other services. Previously, Pickren was WilTel's technical program manager.

Joel Gross has been named senior vice president of corporate development at **Teleport Communications Group, Inc.**, a New York-based alternate access carrier. Gross will formulate the company's strategic direction.

Previously, Gross was vice president of research for Donaldson, Lufkin & Jenrette, an investment firm in New York.

Infonet Services Corp., an El Segundo, Calif., value-added network provider, has named **Larry Morgan** vice president of product marketing. He will be responsible for determining Infonet's overall product strategy. Previously, Morgan was director of communications services, including the company's X.25 and Infolan local-area network interconnection services. ◼

"Whether it be mail APIs, privacy concerns or X.400 interconnection, the EMA has become the place to discuss the top issues."

▲▲▲

Mike Cavanagh
Executive director
Electronic Mail Association

Cavanagh looks back on 10-year tenure with EMA

E-mail group thrived under director's leadership.

Q&A Mike Cavanagh, the Electronic Mail Association's (EMA) first and only executive director, will leave his post at the end of next month after 10 years on the job.

Cavanagh, who worked with a number of trade associations for six years on Capitol Hill before joining the EMA, leaves behind a legacy of fast growth and action at the Arlington, Va., E-mail group.

The EMA, founded in 1983, has grown from eight member companies to about 400 and has been a driving force in bringing users and vendors together to advance the E-mail cause. Cavanagh was particularly effective at getting Capitol Hill lawmakers to act on the issue of E-mail privacy.

Network World Senior Editor Bob Brown recently caught up with Cavanagh to get his thoughts on where the EMA has come from and where the E-mail industry is going.

How did the EMA get its start?

The EMA was founded in April of '83 by eight member companies — a group of E-mail service providers and equipment vendors and one user, Citibank [N.A.].

The intention was to deal with issues relating to the electronic mail industry. Some of these companies had come together before to challenge the postal service's entry into electronic mail, and that issue ultimately brought them together to form the EMA.

So it was essentially a vendor organization?

That's right, and even into 1986, when we had approximately 60 members, we still had only three user member companies. Now about 60% of the members are users.

Has that shifted the nature of the projects EMA works on?

Yes, but not enormously. The vendors wanted a lot of companies using electronic mail profusely and in different ways, so there was not so much friction between the two camps.

What about the friction between users and E-mail service providers over the issue of X.400 network interconnection? The Aerospace Industry Association really had to push vendors to interconnect their networks using X.400.

That was a notable aspect in electronic mail history, and the EMA played a big role in it. The first demo of that was done at an EMA member meeting in San Francisco. A number of the people intimately involved in that project were board members of the EMA and continue to be leaders in our association.

What were the major achievements of the EMA during your tenure?

The top achievement is having the small group in '83 become the central place where people in the industry discuss the key issues affecting them. Whether it be mail [application program interfaces], privacy concerns or X.400 interconnection, the EMA has become the place to discuss the top issues.

(continued on page 35)

Start-ups to break new ground in '93

Management applications, Fast Ethernet and wireless firms among those to watch this year.

First in a two-part series.

As was the case in 1992, the start-ups most worth watching this year are those building network applications and other software products, according to analysts and venture capitalists polled in an annual, informal *Network World* survey.

Middleware and client/server management wares have emerged as particularly hot software areas as users look to build client/server applications and downsize host-based applications.

Futuristic technologies, such as wireless and video networking, are attracting both the investment and user communities, as well. And the local-area network market continues to be ripe with start-up activity.

This series will examine some of the emerging companies that may have an impact on the network industry.

Grand Junction

Announced as a start-up venture last October, Grand Junction Networks, Inc. promises to have a product based on the emerging 100M bit/sec Fast Ethernet technology on the market by the end of this year.

With former 3Com Corp. executive Howard Charney at the helm as president and chief executive officer, and 3Com founder Bob Metcalfe, the principal inventor of Ethernet, on the board of directors, the promise has to be taken seriously.

But the future hardly seems assured for Grand Junction.

Users may welcome the opportunity to transform their 10M bit/sec Ethernet local-area networks to speeds once reserved for Fiber Distributed Data Inter-

(continued on page 34)

Grand Junction Networks, Inc.

Based: Union City, Calif.
Founded: 1992
Primary business: Development of 100M bit/sec Fast Ethernet products

GRAND JUNCTION

INDUSTRY BRIEFS

IDB to buy TRT. Domestic and international carrier IDB Communications Group, Inc. will buy TRT Communications, Inc. from Pacific Telecom, Inc. for about $80 million in IDB stock. TRT generated about $108 million in 1992 revenue. The combined 1992 revenue of IDB and World Communications, Inc., an international carrier IDB purchased last year, was $85 million. The transaction will likely close in the third quarter.

SynOptics posts strong numbers. SynOptics Communications, Inc. last week announced fourth-quarter revenue of $130.5 million, more than double last year's fourth-quarter revenue. The Santa Clara, Calif., wiring hub vendor posted earnings of $16.9 million, more than triple the $4.5 million earned in 1991's fourth quarter. For 1992, SynOptics had revenue of $388.8 million, up from 1991's $248.3 million.

Bytex posts financials. Bytex Corp., a Westborough, Mass., vendor of wiring hubs and matrix switches, announced revenue of $9.92 million for the fourth quarter, down 12% from the year before. Bytex posted a loss of $853,000 for the quarter vs. earnings of $143,000 in the fourth quarter of 1991.

Start-ups to break new ground in '93

continued from page 33

face nets without incurring substantial upgrade costs. But until the IEEE 802.3 Committee settles on its Fast Ethernet standard this fall, the role that Grand Junction will play in this nascent industry will be unknown.

The firm, which is fighting hard to have the Institute of Electrical and Electronics Engineers, Inc. adopt its proposal for Fast Ethernet as the standard, faces several competing proposals, including one from Hewlett-Packard Co. and AT&T, which is at odds with Grand Junction's plan.

Grand Junction is proposing that the Fast Ethernet standard preserve the same media access control (MAC) used in today's 10M bit/sec Ethernet. With an unchanged MAC, Fast Ethernet could be tested and implemented quickly and users could continue to use the same Ethernet management tools they already have. The HP-AT&T proposal, called 100Base-VG, would require changes in Ethernet's MAC but would allow users to continue using voice-grade Category 3 wiring.

Grand Junction is proposing 10Base-T cable using two pairs of Category 5 data-grade unshielded twisted-pair wire. Most Ethernet users today use Category 3 wire, but according to Forrester Research, Inc., that is rapidly changing, with 23% of all users having converted to data-grade unshielded twisted pair. Grand Junction will support any IEEE Fast Ethernet standard that uses an Ethernet MAC, said Jack Moses, vice president of marketing for the firm. If the IEEE deviates from the Ethernet MAC, Grand Junction will produce its own Fast Ethernet product by year end and, in the future, add support for the IEEE standard.

— Ellen Messmer

Networx

Newcomer Networx, Inc. was founded in September 1991 by a team from Boeing Network Management Systems and Services, a group that designs network management software for The Boeing Co. and its customers. According to Christopher Slatt, president and chief executive officer, the new company's mission is to "automate distributed systems management."

Paradigm, Networx's first product, was developed using Boeing technology with help from IBM and was introduced last fall. The Unix-based network trouble-ticketing software is designed to automate problem management on standard management platforms and compete with Remedy Corp.'s Action Request System.

The off-the-shelf product, an alternative to internally developed network management applications, has a starting price of less than $10,000. Proprietary solutions developed in-house can cost more than 10 times that amount, according to a study by Infonetics Research, Inc. in San Jose, Calif.

Paradigm analyzes data collected from the network by the management platform, transforming it into incident reports and helping to correlate the incidents and launch an action plan.

The server portion, which consists of client/server components, resides on the management platform and traps raw network data, letting users and network administrators view and sort records, for instance.

The Unix workstation client holds the database of reported incidents, actions, status information, policies and inventory, as well as provides access to Paradigm functions. A Windows version of the client portion is due by the end of the second quarter.

Networx, Inc.

Based: Bellevue, Wash.
Founded: 1991
Primary business: Software for automating network problem management

NETWORX

Paradigm is integrated with established management platforms, such as SunConnect's SunNet Manager, Hewlett-Packard Co.'s OpenView and IBM's NetView/6000. A version for Novell, Inc. NetWare will be offered in the future, according to Networx's Slatt.

"I'd like to see the future when the management of client/server networks is a benefit or feature rather than a disadvantage," Slatt said. Now that the physical infrastructure of networks has been strengthened, he said, the time has come to focus attention on management.

Later in the year, the company plans to introduce products designed to assist in the management of work group processes, such as problem, change and asset management, he added.

John Rymer, a vice president at Patricia Seybold Group, Inc., a Boston consulting firm, lauded the Networx team's user background for helping them "understand trouble ticketing and how it's used."

The company's challenge for 1993, Rymer said, is to successfully take the product to market against Remedy. "I think they will," he added. "Their product is different enough."

— Fredric Paul

Horizon

In just a couple of years, Horizon Strategies, Inc. has become a front-runner in the emerging field of middleware, software that provides an interface between applications and network protocols.

Horizon's middleware products — Message Express and a downsized demonstration version called Message Express/Tour — are designed to manage peer-to-peer communications between corporate applications running on different platforms.

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Hub Vandervoort Jr. and Brian Watts, founders of the Needham, Mass., company, began as consultants, setting up messaging systems (not to be confused with electronic mail) for clients of Computer Task Group, a consulting firm in Buffalo, N.Y. They saw a need to use middleware to simplify the development of mission-critical distributed applications by offering a simplified, independent API and insulating programmers from the underlying protocol stacks.

Horizon Strategies, Inc.

Based: Needham, Mass.
Founded: 1989
Primary business: Middleware software and tools

To answer this need, Horizon introduced Message Express in 1992. The product differs from other middleware, Vandervoort said, because the company does not participate in the "religious wars" over whether it is better to base middleware on messaging, remote procedure calls, file transfer, or data query and update. All these options are valid, he said, and Message Express supports them all.

Unlike competitors, Horizon extends the concept of what middleware can and should do, Vandervoort said.

In addition to providing multiple application services, Message Express also provides some baseline capabilities in the area of application architectures and interfaces.

Raising middleware to new level

This year, the company plans to expand and enhance its "suite of generalized services for such things as distributed command and event scheduling, database access and data replication," Vandervoort said.

This approach "raises middleware to the application level in a way that no one else is talking about," he added. Eventually, it will give applications generalized, transparent access to new services such as data-driven routing, which directs data based on its content, not just the address.

Horizon's efforts will include the introduction of a variety of complementary products and improvements to existing offerings with more robust object orientation, broader naming service integration and support for up to a dozen new platforms and protocols.

"There's an unaddressed need" for an easier way to build business applications that work on multiprotocol networks, Rymer said. Message Express is "good for a variety of applications and is rather unobtrusive; it goes away when you don't need it."

— *Fredric Paul*

Cavanagh looks back on 10-year tenure

continued from page 33

Much of that is done at our conferences, both in sessions and in the corridors.

Another is the passage of the Electronic Communications Privacy Act of '86. We were much smaller then, but we spent an enormous amount of effort trying to move that legislation along. I'm proud that it was passed and signed into law — into what many call a landmark piece of legislation.

As an addendum to that, we spent a great deal of time with a follow-up effort on the issue of electronic mail privacy within a corporation.

I'm proud that the publication we produced two years ago is a tool kit for developing corporate electronic mail privacy policies.

I'm also pleased to have helped spawn the European and Japanese electronic mail associations. We now have a loose-fitting confederation of electronic mail associations, and that augers well for the future.

What do you see as the major E-mail trends going forward?

I'm not sure about what will be new in '93, but things that have been highlights for the past year or two will continue to be important.

Mail-enabled applications would seem to have the potential to make the electronic system within a corporation have a far wider reaching role in the way the organization operates.

I think we'll see actual implementations and development of a lot of the wireless projects that began to receive attention in the past year. We'll make progress in the area of connectivity, and we'll face some of the challenges with X.400 addressing.

What about groupware and work flow automation products?

These are extremely important parts of where the broadened industry is going. Groupware involves some very sophisticated innovations that will undoubtedly provide opportunities for people to do their business in a different way.

> "Things that have been highlights for the past year or two will continue to be important."
>
> ▲▲▲

Some of the most innovative work being done in the extended definition of Silicon Valley — that which includes Cambridge [Mass.] and other places — is being done in the area of PC software revolving around groupware and electronic mail.

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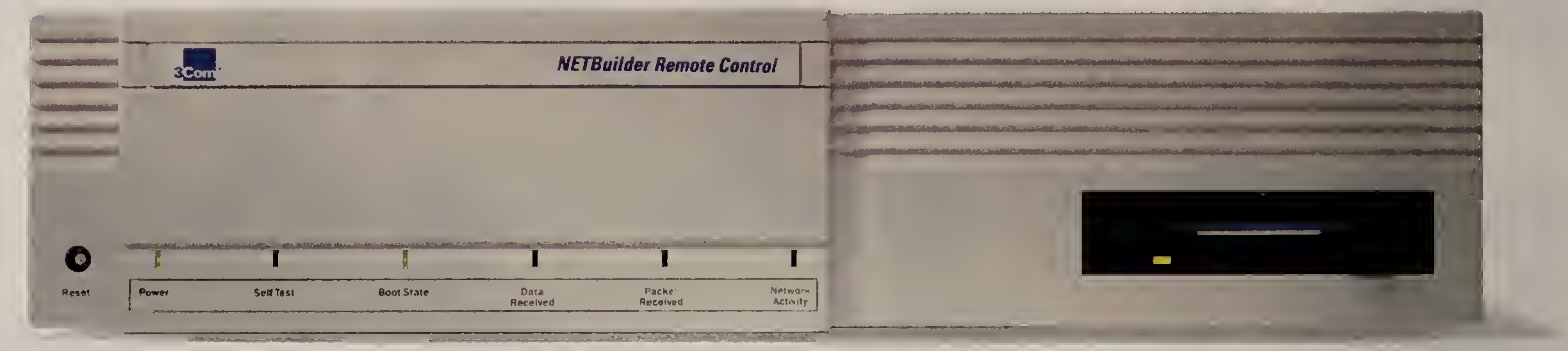

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Worth Noting

Nearly half of the top 1,000 U.S. corporations use videoconferencing as a business tool, and many more are planning to purchase the technology over the next few years, according to "Videoconferencing: The Future of Group and Desktop Systems," a recent study by The Yankee Group, a Boston consultancy.

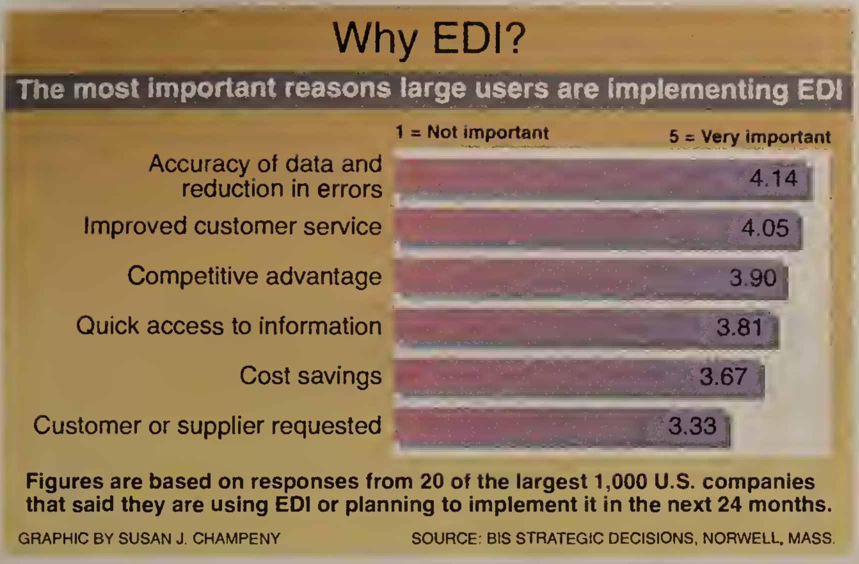
Manager Minutes

The **Central New York Communications Association (CNYCA)** announced it has elected new officers and presented its annual undergraduate scholarship award.

Maryalyce Brown, a senior analyst with E.C. Hunter Associates, Inc., a communications consulting firm in Syracuse, N.Y., has been elected president of the CNYCA. Brown has been active in the group for nine years.

Other officers elected were Vice President Joan Dorman of the Syracuse Police Department, Secretary Natalie Kane of Spectrum Office Products and Treasurer Timothy Dudley of New York Telephone Co. Jeff Gage of EMI and William Maxwell of General Electric Co. were appointed directors.

CNYCA also announced it had awarded a $1,000 scholarship to the Rochester Institute of Technology. The award is made annually to an educational institution in order to benefit a student enrolled in the school's telecommunications program. For more information or to join CNYCA, call (315) 476-3811.


Why EDI?

The most important reasons large users are implementing EDI

Figures are based on responses from 20 of the largest 1,000 U.S. companies that said they are using EDI or planning to implement it in the next 24 months.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: BIS STRATEGIC DECISIONS, NORWELL, MASS.

Cost savings not a factor for firms moving to EDI

Users cite strategic gains as most important.

By Joanne Cummings
Senior Writer

Cost savings is not a primary goal of corporations looking to employ electronic data interchange applications, according to two recent studies on the subject.

The studies found that businesses are implementing EDI more for strategic gains, such as improved customer service, reduction in errors and lower inventory levels, than for cost reductions.

> The results "indicate that EDI is just as much a benefits sell as it is a technical sell."

▲▲▲

According to a survey conducted by BIS Strategic Decisions, a consultancy based in Norwell, Mass., cost savings came in fifth in a list of six reasons for moving to EDI, behind improved accuracy, better customer service, competitive advantage and quick access to information (see graphic, this page).

The study, titled "EDI Market Advice: Stick to Basics," was based on a survey of 20 leading U.S. companies that were either currently using EDI or planning to move to the technology within the next 24 months.

The results show "that EDI is just as much a benefits sell as it is a technical sell," the study stated.

The BIS survey also found that users tend to deploy EDI separately from other messaging applications, such as electronic mail.

Currently, 75% of the companies surveyed utilize separate networks for EDI and E-mail, and of that percentage, 55% said they will continue to use separate nets in the future.

"While companies are rapidly moving mainframe-based messaging applications [such as E-mail] onto LANs, EDI remains steadfast to the mainframe environment," concluded Donald Ryan, vice president of telecommunications at BIS. As a result, the study stated, most users' requirements for seamless network interconnectivity [among messaging applications] are still two to three years away.

The second study, "The Fifth Annual Bar Code/EDI/Quick Response Survey," was prepared by New York-based consultancy Deloitte & Touche for the National Retail Federation.

According to that survey, which was based on responses from the federation's 27 national retail associations and 50 state associations, EDI use in the retail industry nearly doubled during 1992, reaching 39% from just 20% the year before.

Among retailers committed to EDI, shorter reorder and fulfillment cycles and lower inventory levels were viewed as the primary motivating factors.

For more information on the BIS study, call (617) 982-9500. For more information or to receive a booklet on the findings of the Deloitte & Touche study, call (212) 492-2910.

Phone to become multimedia vehicle

Firms expect to deliver multimedia to the home via standard phone lines but not for at least 2 years.

By Joanne Cummings
Senior Writer

Emerging services that provide video and multimedia information feeds directly to the home over traditional phone lines promise to provide businesses with a unique way to reach customers.

Several vendors — including Compression Labs, Inc. (CLI) with AT&T Paradyne, and Nynex Corp. with Philips Electronics N.V. — have announced they are developing such services, although they probably will not become available for at least another two years.

CLI announced it will use AT&T Paradyne technology in a receiver it is developing to support what it calls video dial-tone services. According to Ed Thompson, director of new business development at CLI, the regional Bell holding companies are planning by year end to trial the services, which would enable consumers to order and view a variety of videos and other multimedia information using a box attached to their television set.

The video dial-tone service should offer a unique advertising forum. Advertisers could place ads in movies that are available only in targeted consumer areas. For example, a waterfront area could receive movies with ads about boating equipment. Movies containing ads could be available free to the consumers, Thompson said, whereas movies without ads may charge a fee.

The service differs from interactive television in that the user could, through menu choices, control and customize what is being sent and viewed. For example, users could query the service for all information related to a certain subject, such as automobiles, and receive a listing of what's available. Interactive television is more of a broadcast medium that

(continued on page 38)

E-mail ruling may hamper Clinton administration

WASHINGTON, D.C. — A recent federal court ruling requiring the preservation of the Bush administration's electronic mail tapes has left many considering the ramifications for E-mail utilization in the Clinton White House and the private sector.

Federal Judge Charles Richey ruled that President Bush's E-mail falls under the 50-year-old Federal Records Act and cannot be destroyed until it has been reviewed under stringent guidelines for its preservation. This ruling, which is aimed at uncovering information concerning the Iran-Contra scandal, is the first time electronic communications has fallen under the auspices of the act.

Although the ruling is currently being appealed and it is unclear whether the Bush administration will comply with the order, it has several implications for the new White House staff.

"It will provide a real problem for the Clinton administration," said Michael Cavanagh, executive director of the Electronic Mail Association here. The ruling applies to all White House E-mail, Cavanagh said, even the most casual conversations. "It will be difficult for them to do their job as efficiently as they could if they were allowed to use E-mail freely," he said.

Combing through trash

Cavanagh likened the ruling to requiring that the contents of every White House wastebasket be saved forever. "That enters the realm of ridiculousness, but maybe that's what's happened with electronic mail in this decision."

Others were not so sure. "It's one of those issues that has a balance on both sides," said Ronald Plesser, a partner in the Washington law firm of Piper and Marbury

(continued on page 38)

Phone to become multimedia vehicle

continued from page 37

enables viewers to interact with what they are viewing on the screen ("Interactive TV gains support in industry," *NW,* Aug. 17, 1992).

This ability to tailor the feed to individual needs also results in a focused marketing or sales channel. When customers request information pertaining to automobiles, for instance, they could receive general information as well as video clips featuring a certain model, a listing of dealerships where the car is available and price lists.

Behind the service

CLI is utilizing AT&T Paradyne's Asymmetrical Digital Subscriber Line (ADSL) technology, which enables bandwidth-intensive data, such as a video feed, to be compressed and transmitted over traditional twisted-pair copper wiring, Thompson said. The CLI receiver decompresses the feed and displays it on the home TV or personal computer in real time.

The service would be based on a video jukebox-like server located at the phone company's central office, he said. This server would hold a variety of multimedia, video, graphical and textual information in compressed digital form. Home users would then choose a video or other information from a menu on the TV, and the CLI box would signal the central office server with the choice. The server would then utilize ADSL to send the feed to the home.

Both the CLI and AT&T Paradyne technology are currently under development, and Thompson declined to say when the services might become available.

Separately, Nynex and Philips Electronics announced they are jointly developing and testing an information service that will deliver both voice and text over traditional phone lines and display the information on new telephones with screens.

The phones, which would cost about $200 each, are currently under development and would come equipped with a small screen suitable for viewing text and images, the firms said.

Bellcore standards

Last month, Bell Communications Research, the research arm of the seven RBHCs, published new standards for the phone services. Nynex and Philips Electronics said their service, which would link callers with information services such as financial news services, adhere to the Bellcore standards and allow users to choose among several brands of screen phones.

The companies declined to say when the new service might become available or whether they will be manufacturing the screen phones. ◘

E-mail ruling may hamper new admin.

continued from page 37

and the former telecommunications team leader for the Clinton transition. "From a freedom of information perspective, it's a good decision. From an E-mail decision, we're concerned about it, but I don't think it's overpowering."

Plesser said the ruling would encourage the White House staff to treat sending E-mail as if they were writing a memo, rather than using it in an informal manner.

"I understand the concern that E-mail will now be a record and it may discourage some informal discussions," he said. "On the other hand, I think the issues in the case are broader than E-mail and relate to all records of public policy that should not be destroyed, and I'm in favor of that."

He did caution that the ruling will not automatically make all White House E-mail public information because President Clinton will still have the option of using his executive privilege to prevent information from being subpoenaed.

Privite sector implications

Beyond the White House, however, the implications for the private sector are minimal.

"This doesn't have any direct ramifications for the business sector," Cavanagh said. "There certainly is not going to be a law requiring every private company to keep everything on their computer disks forever; you'd have to carve out something the size of the state of Wyoming to store those computer disks."

Both Cavanagh and Plesser were in favor of having some kind of E-mail retention policy, as do most businesses in the private sector. Once a specified period has elapsed during which the information may be needed to reconstruct certain events, for example, it can be destroyed.

"Increasingly, businesses institute retention policies for electronic mail tapes and other computer tapes [in addition to paper records]," Cavanagh said. "Generally, that's the correct route to go." ◘

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OPINIONS

THE NETWORK WORLD 500

BY KIM MYHRE

Enterprise nets are key to business strategy of the '90s

As businesses look for ways to control costs, maximize installed equipment investments and build network architectures to support emerging strategic business applications, management is viewing the enterprise network as a key element of business strategy.

Two factors have converged to propel enterprise networking to the forefront of business strategy: cost and competition. Enterprise networks have the potential to improve access to and sharing of systems, peripherals, applications and information throughout the enterprise. This enables users to conduct business processes more efficiently and achieve a better return on information technology investment.

Members of the Network World 500, an elite group of users employed by major U.S. firms, understand the value of building enterprise networks. In a survey of the Network World 500 conducted jointly by International Data Corp., *Network World* and World Expo Corp., 38.1% of the 500 executives interviewed cited maximizing information technology investments as the enterprise network's primary objective, while 17.9% said cost control was the primary motivation.

But more importantly, 40.8% of the Network World 500 executives view support for business-critical applications as the enterprise network's primary objective. This finding is at the heart of information technology strategy for the '90s.

Still waiting for technology to deliver on its promise of improved productivity, many businesses are reevaluating the relationship between information systems and business processes. The question is changing from one of how technology can be implemented to automate existing business processes to one of how it can empower a new, more competitive way of doing business. The need to reengineer information systems to support competitive business advantage will continue to drive enterprise network strategy as a primary approach to managing technology investments.

Yet making the transition from traditional hierarchical nets to local-area network-centric enterprise nets is no small undertaking. While implementing an enterprise network strategy provides numerous advantages, it presents many challenges, as well. Budget constraints, the need for continued support and migration of installed technology that is rapidly becoming obsolete, vendors' inability to support standards or provide for basic levels of compatibility, organizational politics and the lack of in-house expertise all stand to confound even the most diligent enterprise net planning and management staff.

Building an enterprise network will create opportunities for those who clearly understand the business value of information, support the integration of past and planned information investments, and overcome the resource and organizational obstacles. ◻

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EDITORIAL

Stepping up to the multivendor support challenge

In the world of information nets, where MIPS and megabytes reign supreme, too little attention is paid to service and support. Perhaps that's because it is complicated, people-intensive and unglamorous.

Yet, service and support is a central concern for the users who integrate new and existing technologies into enterprise nets that must guarantee near-perfect uptime to support applications that give the company a competitive edge.

Need proof? Take a read on this week's Reader Advocacy Force (R.A.F.) article, which prescribes some cures for service and support ills (see story, page 1). The piece, which is based on an independent survey commissioned by *Network World* and Dataquest, shows the quality of service and support provided is the top factor in a first-time product buy.

Service and support becomes even more critical when a user is changing suppliers.

Users spend a lot of money internally and externally for service and support, and vendors have a great opportunity to profit from the growing complexity of managing networked information systems — both in additional sales and increased service revenues.

But vendors have to step up to the service challenge.

Today's enterprise networks are multivendor beasts. Yet, it's clear from the *NW*/Dataquest survey findings that vendors come up short in supplying the skills and tools needed to solve multivendor network support problems. That's the No. 1 problem cited by *NW* readers. (To be fair, users are struggling with the same problem internally.)

Vendors are spending millions of marketing dollars to position their products as interoperable. But they need to make an equal commitment to providing world-class support and service that helps users deal with the intricacies of building and running multivendor networks. ◻

OPINIONS

THE BLUE VIEW

BY ANURA GURUGE

IBM is still not biting the bullet hard enough

Faced with daunting financial woes, IBM's management has again opted for the easy way out. Planning this year to divest itself of as many people as it did last year may not seem like the easy way out. Nonetheless, that is what it is — an expedient, tactical and somewhat ruthless measure to quickly bolster the bottom line.

There's a better way. Gracefully shedding one or more systems from its product line while providing users with a nondisruptive migration path would permit IBM to reduce costs in a much more significant and long-term manner.

There's no question that people cost money. But the highest cost burden IBM is struggling with is the support and sustenance of hugely divergent and disparate computing platforms and operating systems.

This diversity extends to IBM's four semioverlapping and incompatible communications controller families: the 3745/3746 Communications Controllers, the 3172 Interconnect Controller, the 3174 Establishment/Subsystem Controller and the 6611 Network Processor bridge/router.

The key to consolidating Big Blue's diverse product lines is its Power Reduced Instruction Set Computing (RISC) technology, which IBM currently uses in its RISC System/6000 and 6611. As part of its strategic alliance with Apple Computer, Inc., IBM this fall plans to ship its IBM Power Personal Computer, a Power RISC-based PC that will run the Pink operating system.

Power RISC has had enviable price/performance characteristics from Day One. The current lackluster performance of the 6611 is not a true indication of the potential horsepower of this technology, however. The 6611 suffers a horsepower shortfall because it runs unoptimized routing software on top of a fully featured, resource-hungry Unix.

As an indication of Power RISC's capability, IBM has already prototyped a Power RISC-based cell relay switch — the so-called Paris switch — with a 6G bit/sec bus capable of 10 million packet/sec throughput. Power RISC, hence, has the requisite muscle. The 6611 only has to be tweaked to exploit this power.

> The key to consolidating Big Blue's diverse product lines is its RISC technology.
>
> ▲▲▲

With a little ingenuity and a bit of hard work, IBM could transform the 6611 into its only communications controller import. If motivated — and in today's climate, that shouldn't be an issue — IBM could pull this off in 18 months.

Among the obstacles to overcome is the fact that today the 6611 cannot be channel-attached to a System/3X0 host, which automatically precludes it from encroaching into 3172 or 3745 turf. This, however, is not a big deal. The 6611 uses a Micro Channel Architecture (MCA) bus, and IBM is already selling MCA-based channel-attachment cards. So the actual hardware is there. It just needs to be put to use.

This leaves the issue of software capability.

Some Network Control Program (NCP) functions and Systems Network Architecture local-area network gateway functions — a la the 3172 and 3174 — will have to be added to the 6611 repertoire.

IBM is already busy torquing NCP so that the next release of the software, due in June, will not only support Network Node functions in an Advanced Peer-to-Peer Network (APPN), but also exploit APPN protocols for interhost interactions.

The 6611 will also be APPN Network Node capable by then — albeit initially only over Transmission Control Protocol/Internet Protocol networks. Thus, NCP and 6611 functionality is melding.

IBM wants to offer frame relay and cell relay on the 3745. The Power RISC-based 6611 is probably a better platform for such high-speed applications. Furthermore, the Paris switch already has Power RISC.

Putting these pieces together shows that striving for a single, multipurpose communications controller is indeed technically feasible. The only nagging question is, why hasn't IBM announced it?

With a tad more ingenuity and a lot more hard work, this same consolidation technique can be applied to address the whole gamut of IBM's computing platforms.

With this in mind, IBM really should hold on to its people and instead start getting rid of some of the old iron. ◘

Guruge is an independent consultant specializing in internetworking and IBM network architectures. He writes extensively, presents seminars worldwide and can be reached at (603) 878-1303 or via the Internet/MCI Mail at aguruge@mcimail.com.

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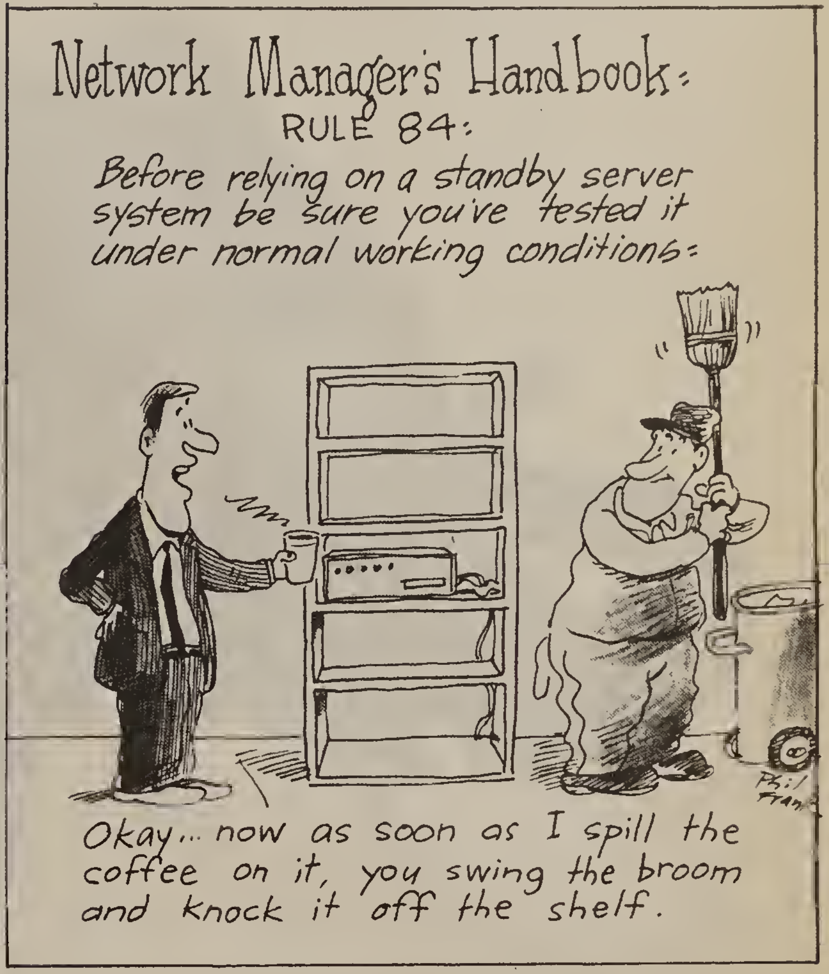
TELETOONS

BY FRANK AND TROISE


Network Manager's Handbook:
RULE 84:
Before relying on a standby server system be sure you've tested it under normal working conditions.
Okay... now as soon as I spill the coffee on it, you swing the broom and knock it off the shelf.
Frank

and another thing . . .

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For more information on the Buyer's Guides listed below, call Charles Bruno, features editor, at (508) 820-7414, or Kyle Nitzsche, associate features editor, at (508) 820-7427.

Contacting us early in the process will help us determine the focus of the Buyer's Guide and compile the list of vendors that should participate in the survey.

Topic	Issue date
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DATACOM

BUYER'S GUIDE

FRAME RELAY SERVICES

Frame relay selection is no picnic

While frame relay has matured in the past year, service selection can be like walking through a mine field.

By DANIEL BRIERE and CHRISTOPHER FINN

Amid the growing hype over speedy new offerings such as Switched Multimegabit Data Service and Asynchronous Transfer Mode (ATM), frame relay is quietly beginning to fulfill its early promise as a data communications service suited for today's LAN interconnection needs.

In just over a year, frame relay service providers have quelled user concerns about a lack of adequate support and overblown claims that the technology could handle burst modes with ease.

Still, selecting the right frame relay service for an enterprise is no picnic. Prospective frame relay users are bound to encounter a myriad of complex technological considerations. And even when they've sorted them out, buyers still have to negotiate a major pricing hurdle.

The fact is that service providers do not even come close to offering standard pricing for true apples-to-apples comparative shopping. Users should be ready to negotiate features, terms and conditions as if they were buying a car.

The benefit of frame relay is it provides private line-like connectivity for data transmission using a public fast packet network. Currently, customer locations are connected through a preprovisioned static connection called a permanent virtual connection (PVC). Customers can attain connections up to 1.536K bit/sec now and potentially up to 45M bit/sec in the future.

Along with the PVC, customers also typically purchase a committed information rate (CIR), which is a guarantee to obtain a certain level of throughput under normal circumstances.

Two key benefits frame relay offers are the ability to add or subtract sites from the provisioned mesh networks with relative ease and an appealing cost/performance ratio. Frame relay is increasingly seen as an attractive candidate for mesh networking at 56K bit/sec and higher. But users say that if continuous high bandwidth between two points is required, point-to-point private lines might still fit the bill better than frame relay.

Both ends of the market

The frame relay market is characterized at the high end by port connection speeds and CIRs of 256K bit/sec or faster — in some cases up to T-1/E-1 speeds — and by comprehensive bundled support options. Such support can include network design, installation, ongoing maintenance and carrier responsibility right up through the customer port on a bridge/router.

At the high end, carriers offer services with wide bandwidth virtually guaranteed between any two nodes. In addition, large customers with complex nets can, in some cases, obtain provisioned links between two particular nodes where each direction of the link has a different CIR.

This is particularly useful, for instance, in nets supporting client/server applications. Customers would need to purchase one CIR to support data requests spawned by client workstations and a larger CIR for the greater traffic generated by servers sending data down to requesting nodes.

At the low end of the frame relay market, services are available at slower connection speeds and sometimes with so-called zero CIR, meaning throughput will vary widely depending on the network load. Low-end services frequently entail carrier responsibility that ends at the local loop.

Carriers also have designed some market segmentation into their product lineup on the basis of price. Pricing plans are tailored to various customer and location sizes. Carriers sometimes discount the services by bandwidth, with higher bandwidth options generally priced incrementally lower than lower speed services.

Some providers, such as WilTel, will also give users discounts if they guarantee a certain amount of traffic from frame relay and other services in the carrier's portfolio. These discount plans can cut rates by more than 50%, in some cases.

Regardless of which class of frame relay service customers decide to implement, there are several prominent criteria worth examining when evaluating any frame relay service.

The primary consideration is connection speeds and CIRs. A second factor is the availability of oversubscription allowances to enable customers to support multiple PVC connections via a single customer premises equipment port.

Beyond that, the geographic availability of the service — based on the proximity of access nodes and whether the carrier defrays the cost of backhauling to its points of presence (POP) — is a factor worth closer inspection.

The level of support services offered is also shaping up to be an important buying criterion, as is the availability of detailed management information presented in the format the customer needs. Some customers might also want to examine which carriers offer end-to-end frame relay connections to particular foreign countries (see "Frame relay makes global mark," page 49).

The Short List

- ☑ AT&T's InterSpan Frame Relay Service
- ☑ BT's ExpressLane
- ☑ MCI's VPDS Frame Relay
- ☑ WilTel's WilPower

Complete details about The Short List appear on page 46.

There are several additional hidden factors users may want to consider, such as the network platforms used to provide the services, whether the carrier plans to support switched virtual connections (SVC) and whether they have implemented or plan to implement the new network-to-network interface (NNI) for connecting to other frame relay networks.

Plethora of POPs

One key differentiator among frame relay services is the proximity of the providers' switches to end-user sites and the charges related to accessing

(continued on page 46)

Frame relay services

Company	Service	Speeds supported (K bit/sec) C = CIR P = Port connection B = Both																No. U.S. POPs	Backbone network			Throughput		Management	NNI	CO-based FRAD	CPE options	Pricing method
		16	19.2	32	48	56/64	112/128	224/256	336/384	448/512	560/640	672/768	784/896	1,024	1,344/1,536	2,048	Other		C = Cell relay F = Frame relay	Fixed cell size (byte)	Variable cell	Oversubscription (percent)	Frame delivery (percent)	R = Reports S = SNMP T = Terminal			C = Carrier financing L = Leasing P = Purchase	E = Equipment covered by service fee F = Fixed price per link U = Usage-based
Ameritech Advanced Data Services (708) 248-6508	Ameritech Frame Relay					B									B			(1)	F		✔	(1)	99.999	S		✔	C, L, P	E, F
AT&T (800) 247-1212	InterSpan Frame Relay Service		(2)	(2)	(2)	B	B	B	B	B		B		B	P			200	C	24		(1)	99.9999	R, S, T	✔	✔	C, L, P	E, F, U
Bell Atlantic Corp. (703) 974-3562	Bell Atlantic Frame Relay Service					B	C	C	C	C		C		C	B			11	C	53		(2)	(1)	R, S, T			L, P	F
BellSouth Corp. (205) 977-0738	Frame Relay					B									B			4	C	24		(2)	(1)	(1)			L, P	F
BT (800) 872-7654	ExpressLane					B	B	B	C	B		C		B	P	P		35	C	24		200	99.1	R			C	E, F
Cable & Wireless Communications, Inc. (703) 760-3894	LAN Connect Frame Relay		C			B	B	B	B	B		B		B				100	F		✔	(2)	99.5	S, T			L	F
CompuServe, Inc. (800) 433-0389	Frame-Net					B	B	B	B	B	P	B	P				✔	(1)	C	24		200	99.9	R	✔		L	E, F
Graphnet, Inc. (201) 837-5100	GraphPak Frame Relay		C			B	B	P										17	F		✔	(1)	99.6	S		✔	L, P	F, U
MCI Communications Corp. (800) 933-9029	VPDS Frame Relay	C		C	C	B	B	B	B	B		B	B	B	B		✔	300	C	53		200	99.9999	R, S, T			C, L, P	E, F, U
Nynex (914) 644-5470	Frame Relay Service					B									B			30	F		✔	(1)	99.99	R			L, P	F
PacNet Telecommunications, Inc. (800) 223-6893	PakLink					B		B	P	B		C		B				9	F		✔	200	99.99	R, S, T	✔	✔	C, L, P	E, F
Rogers Network Services (416) 446-1233	Frame-Path					B	B	B	B	B	P	B	P	B			✔	5	F	24		200	(1)	R	✔		L	E, F
Southwestern Bell Corp. (314) 235-9800	Frame Relay Service					B			B						B			12	F		✔	(2)	99	(2)		(2)	L, P	F
Sprint Corp. (800) 736-1130	Sprint Frame Relay Service		B			B	B	B	B	B	B	B	B	B	B		✔	300	F		✔	(2)	99.999	R, T	✔	(2)	C, L, P	E, F, U
US West Communications Advanced Communications Services (612) 663-3084	Frame Relay Service	C		C		B	C	C	C	C		C		C	P		✔	14	C		✔	200	(1)	R, S			L, P	F
WilTel (800) 642-2299	WilPower					B	B	B	B	B		B		B	B		✔	174	C	24		200-400	(1)	R, S		(2)	C, L, P	F

FOOTNOTES:
(1) Information not available
(2) Negotiable

CIR = Committed information rate
FRAD = Frame relay access device
NNI = Network-to-network interface
POP = Point of presence

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 45)

those switches. Users stand a better chance of minimizing their local access charges if they go with a carrier that provides greater numbers of frame relay switches across its net.

If a carrier has few POPs, it is often necessary to provision other types of lines to reach the POP, a move that would drive up local access charges — in some instances negating the cost benefits of frame relay itself.

One consideration is that some carriers — including BT and CompuServe, Inc. — will bundle in the access if user sites are located within a certain mileage band outside of the POP.

BT, for instance, charges a fixed rate as long as the user site is within 60 miles of a POP. Other carriers also pick up the cost of so-called backhaul access fees — for the services used to connect to a frame relay net — while others charge a mileage-based fee.

MCI Communications Corp. recently announced its Access Pricing Plan. This announcement indicates a shift in how the carrier passes on local access costs to users. Now, in return for a user locking in a certain number of access sites for an agreed length of time, MCI will discount the access charges passed on by local exchange carriers. Previously, MCI passed those local exchange carrier charges on to the customer via a straight mileage-based cost structure.

One of the biggest changes in the frame relay arena in the past year has been huge investments by carriers in frame relay switch deployment and in extending frame relay to more POPs in their networks.

As a result, geographic access to services is becoming less of an issue when choosing among the major providers. There are still notable differences. For instance, AT&T claims to have more than 200 POPs, MCI and Sprint Corp. claim to have more than 300 and BT only has 35.

Customers should note that while interexchange carriers claim hundreds of POPs, only a fraction of those — typically 30 to 40 — house frame relay switches that comprise the carriers' frame relay net. The other POPs merely act as a means for

(continued on page 49)

The Short List:

Frame relay services

The Short List highlights offerings we recommend you examine during the purchasing process for frame relay services. Vendor offerings included on The Short List meet the buying criteria we've outlined in the accompanying Buyer's Guide article and, in some cases, offer additional useful features. Those criteria reflect the needs of users with multivendor enterprise networks. Your criteria may differ based on network configuration and application needs.

■ **AT&T's InterSpan Frame Relay Service.** With one of the broadest number of points of presence supported, AT&T eases user access to its service with its remote dial-in capability. Like other carriers, AT&T offers integrated access to InterSpan, which allows multiple services to share the same T-1. But AT&T's edge is a greater number of T-1s to support integrated access. AT&T also has extended InterSpan to seven European countries and provides X.25 gateways for additional coverage abroad.

On the management side, AT&T is the only provider to offer a Simple Network Management Protocol-based monitoring platform for viewing frame relay utilization and circuit availability, and has the capability to provide real-time monitoring of routers on customer premises.

■ **BT's ExpressLane.** This service's strength lies in its extensive international frame relay presence; BT also provides local support to users who extend their frame relay nets to sites abroad. Another plus is that BT views frame relay as a value-added service and markets it as a fully packaged service with considerable support bundled in.

■ **MCI Communications Corp.'s VPDS Frame Relay.** MCI sports a cell relay backbone that supports 53-byte cells. Also, it's the only carrier to offer DS3 trunking between frame relay switches, which minimizes switch-to-switch delay. It also offers usage-based pricing by the megabyte transfer as well as nifty unidirectional provisioning of permanent virtual circuits (PVC), which allows users to maintain separate committed information rates within a PVC.

■ **WilTel's WilPower.** If you're looking for a soup-to-nuts offering that includes provisioning of frame relay circuits, a personalized approach for obtaining net management statistics and other support services, then WilPower is worth considering. WilTel was the first company to offer frame relay service and is said to have the largest user following.

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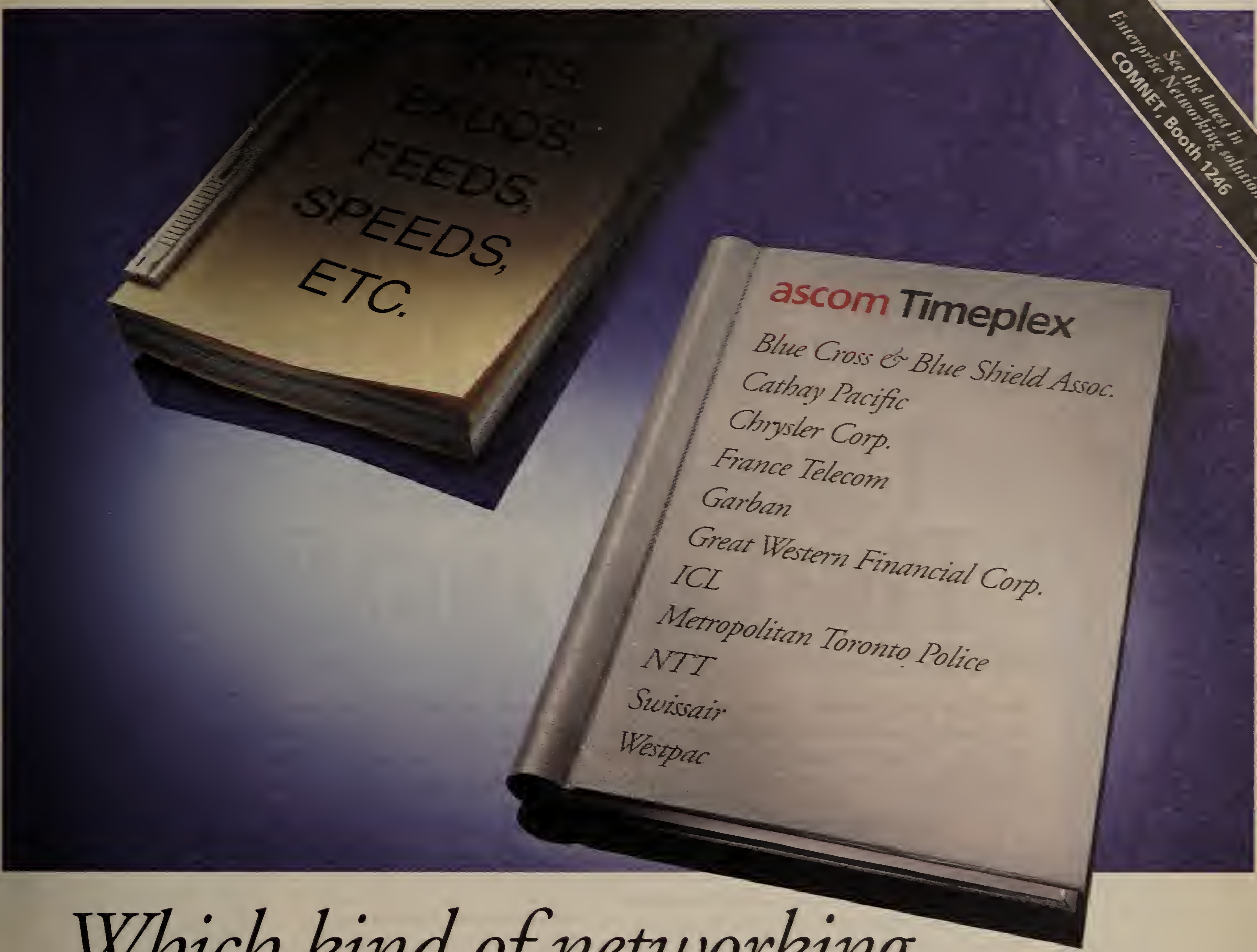

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Frame relay makes global mark

Faced with the prospect of spending about $300,000 annually to link sites in the U.K., Ireland and France via private lines to its U.S. network, Teradata Corp. of El Segundo, Calif., opted instead for frame relay.

As a result, the database management system provider is spending about $40,000 a year on frame relay service between its U.K. hub and its California headquarters, according to Mark Heil, a network analyst at the company.

Heil believes frame relay service could connect all of the company's international sites for a little over half the cost of the private-line solution. And, he adds, "It's a real bonus to deal with a single international carrier."

To its credit, Heil says BT turned the company onto international frame relay, and subsequently, Teradata uses the carrier's BT ExpressLane service.

BT, however, is not the only carrier with its sights set on the international frame relay market. AT&T has extended its frame relay network to seven European countries with the availability of an X.25 gateway for additional coverage. The X.25 gateway enables users to reach out to European sites not yet supported by frame relay.

Sprint Corp. has announced plans to install frame relay nodes in Canada, Japan and the U.K. And CompuServe, Inc. is planning to extend its network by installing nodes in London and Toronto, and interconnecting its network with Rogers Network Services' net to extend service into all major Canadian metropolitan areas.

MCI Communications Corp. plans to leverage its international partnerships and alliances to provide international connectivity soon, and WilTel will be announcing international plans this year.

The most potent competitor for frame relay seems to be coming from Infonet Services Corp.'s Infolan service, which is essentially a worldwide, Transmission Control Protocol /Internet Protocol-based router internetwork. Infolan serves more countries than most international frame relay services and targets the same types of applications as frame relay.

Apparently, Infonet has been successful at converting some early frame relay users to Infolan.

In a recent example, Infolan displaced a public frame relay service as the international service choice for Trimble Navigation, Ltd. of Sunnyvale, Calif. Trimble experienced extremely poor performance with frame relay and moved to Infolan because it is a TCP/IP-based network and, consequently, the transmissions have less overhead in the packets.

Infolan also has the advantage of being currently available in 18 countries with significant national support.

"As with any service, what is announced does not matter; what is available is important," says Infolan user Suki Mudan, president of Comwave, Inc., an enhanced facsimile services provider. Comwave uses Infolan to link its enhanced fax network nodes in several countries for the delivery of broadcast fax messages around the world.

In those global sectors where frame relay availability is not an issue, the technology is coming on strong as an economical alternative to dedicated private lines. This is being driven by U.S. demand, but given the fact that powers such as AT&T and BT are actively pursuing this market, it is just a matter of time before frame relay is a truly global service.

— Daniel Briere and Chris Finn

(continued from page 46)

users to hop onto the interexchange carrier's network, which is set up to pass frame relay traffic to the appropriate switches. The benefit to users is that the carrier's net is typically more secure than local connections.

In addition to the number of POPs and frame relay switches, users should note that some providers, such as PacNet (formerly Diginet) and Rogers Network Services, only operate in certain regions — in the Pacific Northwest and Canada, respectively.

Some Bell operating companies, including Southwestern Bell Corp. and US West, Inc. are foregoing mileage-sensitive access charges within a metropolitan area by paying for the backhaul to the nearest switch themselves. Other BOCs, such as Bell Atlantic Corp. and BellSouth Corp., are simply pricing access mileage to the nearest carrier POP.

Customers should also be aware of the physical paths their traffic will take. Beware of any paths that require traffic to pass through more than two nodes. Each switch in a frame relay net adds some inherent delay to the transmission.

When traveling over frame relay backbones with speeds in excess of T-1, such as MCI's DS3 net, the delay is hardly noticeable. But a frame relay backbone that runs at T-1 or less will be more sensitive to switch-to-switch delay.

Another factor is whether or not all potential customer nodes are in major metropolitan areas. If they are, access will not be a major factor.

Performance choices

While service architecture is one factor worth evaluating, the carriers' installed equipment may directly impact the service's performance. The choice of switch vendor and backbone transmission format employed by the carrier directly affects network performance. The most visible difference between carrier networks is the carrier's implementation and interpretation of the CIR.

The carrier's choice of switching platform that makes up the network fabric determines how the carrier implements CIR. Carriers that base their offerings on StrataCom, Inc. switches will have a different way of provisioning frame relay burst capacity than another carrier with a different switch.

Until recently, StrataCom IPX switches didn't have a fully developed fairness algorithm for how they treat burst mode capacity, and, consequently, those switches limited burst capabilities.

But StrataCom has since developed its ForeSight switch software to change the parameters of CIRs so they can flexibly accommodate burst modes.

Frame relay nets also support either of two types of traffic: 24- or 53-byte fixed-length cell relay traffic or frame-by-frame traffic. Those carriers — such as MCI — that offer 53-byte cell relay switching fabrics are better positioned to migrate customers to ATM when it becomes available.

Sprint, on the other hand, is pursuing parallel development of frame relay and ATM networks. Rather than dropping ATM switches into its frame relay backbone, Sprint is building a totally separate ATM network.

In the future, pure frame relay nets will likely be positioned as feeders to ATM backbones, until ATM interfaces are made available to end users.

Another factor affecting performance is the CIR. A common misconception is that CIR represents a quantity of bandwidth always available to the user. That, however, is incorrect. To be more precise, the CIR means data sent under this limit will have priority over data sent above this limit in burst mode. Data sent over this limit is marked "discard-eligible," which means that it will be the first data to be discarded in times of network congestion.

Initial concerns over congestion caused many carriers, such as WilTel, to implement CIR in a conservative fashion favoring congestion avoidance over extended burst capability, which allows users to burst above the CIR for more than a few milliseconds. By limiting extended bursting, you can proactively avoid congestion, says Chris Heckert, WilTel product manager.

Sprint, by contrast, implemented frame relay in a more literal but possibly risky fashion, allowing extended bursts. The frame relay standard allows for bursts above CIR for unlimited durations during times of network availability.

The ability to burst for extended periods of time also creates a potential problem when a few customers could tie up the network for a short period.

Carriers have what is called a fairness doctrine, which is a set of rules that govern how users share the network, especially when demand is high. A carrier should be able to explain its fairness doctrine to any potential customer.

In general, carriers have extended their bursting capabilities over the past year, due to advances in network management software and the fact that there have been few reported congestion incidents.

MCI also offers an innovative option called assymmetric PVCs, meaning CIR is provisioned in a unidirectional fashion. That would allow a PVC to support a 384K CIR in one direction, and a lower or higher rate in the other.

One word of caution to first-time service users: BOC services being tariffed today do not support CIR at all. Instead, the BOCs have chosen to roll out the services in the most simplified format possible.

This means two or three speeds with distance-insensitive pricing. The BOCs plan to provision enough network capacity so customers will not lose data except under extraordinary circumstances and are evaluating the need for CIR services, with the exception being US West, which will be offering CIRs to customers on a no-extra-cost basis in this year's second quarter.

One of the bigger changes regarding frame relay in the past year has been at the local access level. In early 1992, the only way to access interexchange carrier frame relay services was through a dedicated connection. Users could take advantage of existing T-1 access connections through T-1 access partitioning services.

Such capabilities allow customers to partition T-1 access for simultaneous use of multiple services from a single carrier. This favored a customer's current carrier, though, and inhibited true competition.

Network access

Today, there are a growing number of options for access to frame relay services.

Possibly the most exciting is frame relay access within the local loop to access interexchange carrier frame relay services. Local exchange carriers plan to interconnect their frame relay services to interexchange carrier services, thus offering a flexible alternative to high-cost dedicated facilities in local loops. While not yet available, carriers have demonstrated the feasibility in several trials.

Availability of the more flexible access alternatives will probably hinge on the success of frame relay over the next six to 12 months. The main advantage of this access method is the ability to link several sites within a metropolitan area to an interexchange network through an access port.

Also of interest is switched access to frame relay networks. Sites with occasional use can now access interexchange carrier services via digital and analog switched services.

AT&T, for instance, offers analog dial-up access to its InterSpan frame relay service at speeds up to 14.4K bit/sec and supports V.42bis and MNP5. This provides an economical alternative to dedicated lines in the local loop.

BT also plans to offer dial-in service within the next quarter. Sprint has announced switched access to frame relay through Integrated Services Digital Network Primary Rate Interface, while AT&T and MCI already offered it.

AT&T, BT and Sprint also offer X.25 gateways to frame relay service. This allows customers to interconnect existing X.25 service with the frame relay service. This is especially important for multinational corporations with locations in less developed countries where frame relay will not be avialable in the foreseeable future.

Net management progress

Beyond the access choices, there are many service-level issues, which should be examined in deciding among providers. One major issue is network management. In a frame relay context, management generally means the ability to monitor network performance and utilization

(continued on page 54)

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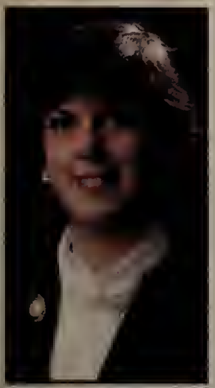

SMDS

By Robyn Aber

The networking options offered by Switched Multimegabit Data Service (SMDS), frame relay and Asynchronous Transfer Mode (ATM) and the hype surrounding these high-speed packet options are causing confusion. These emerging services and technologies complement one another to meet different internetworking needs. So the service or technology combination you choose will depend on your application requirements.

SMDS is ideal for users with multiple locations needing shared access to bursty, data-intensive applications that run on separate hosts and local-area networks. It can also be used to exchange data across one or more companies and can interconnect remote Ethernet, token-ring, Fiber Distributed Data Interface or even ATM-based LANs without degrading performance.

SMDS is a high-speed, low-delay public packet-switched data service offered by local and interexchange carriers.

Currently supporting access rates up to 45M bit/sec and with plans to increase to the Synchronous Optical Network Optical Carrier-3 rate of 155M bit/sec, SMDS offers LAN-like performance over wide areas. And like a LAN, SMDS is a connectionless service. Data is transferred between users in 53-octet-long cells without prior setup of a network link. SMDS can also be managed like a LAN via Simple Network Management Protocol-based tools.

Although SMDS is a public service, its addressing capabilities enable users to design virtual private networks and maintain secure and confidential communications. Data security is ensured by assigning a Subscriber Network Interface for each subscriber and by performing address screening and validation.

With SMDS, users can handle peak traffic demands by getting bandwidth on demand and they can gain cost efficiencies by requiring fewer public network access links than star- or mesh-configured nets. Fewer access lines means less customer premises equipment must be purchased.

Carrier plans to deploy SMDS in more than 40 metropolitan areas nationwide by the end of 1993 are on track.

Local exchange SMDS services are already being sold by Ameritech, Bell Atlantic Corp., GTE Telephone Operations, Pacific Bell and US West, Inc. Nationwide interexchange service will be offered by MCI Communications Corp. in the second half of this year.

In addition, more than 20 U.S. equipment manufacturers are offering SMDS-compatible products, including bridges, routers, protocol analyzers, data service unit/channel service units and switches.

Users who buy SMDS equipment today will be making capital investments that are good for the long term because SMDS will eventually interwork with ATM and frame relay. Carriers will implement ATM as a backbone technology that can transport many forms of traffic, including SMDS.

This is the first in a periodic series on emerging technologies. In this installment, the groups developing ATM, frame relay and SMDS specifications were asked if all three will coexist and explain how the technology they are developing can be best used.

Furthermore, the SMDS Interest Group, an association of carriers and equipment suppliers developing SMDS interoperability specifications, is exploring ways to provide frame relay-based access to SMDS at rates below T-1.

SMDS is spreading overseas, too. In the U.K., a pilot SMDS service will soon begin operating in more than 45 locations. The European SMDS Interest Group, Pacific Rim SMDS Interest Group and U.S.-based SMDS Users Group were formed to extend the growing commitment to SMDS.

SMDS, frame relay and ATM technology aren't mutually exclusive. And they aren't interim solutions. There is a place for all three offerings, but the challenge for carriers, equipment suppliers and users is to work together to sort out the options. ◻

Aber is treasurer of the SMDS Interest Group and a fast packet product manager at Bell Communications Research.

Frame relay

By Holger Opderbeck

The success of a switching technology is ultimately measured by its broad acceptance and success in solving user problems. However, none of the emerging high-speed switching technologies, such as Switched Multimegabit Data Service (SMDS), Asynchronous Transfer Mode (ATM) and frame relay, can make that claim yet.

Users can expect all three to survive in some form, with ATM likely emerging as the backbone technology of the future and frame relay being used where ATM cannot be cost-justified or as an access link to private and public nets. SMDS will provide a link to the public network.

When comparing the three technologies, users should understand how each fits into public and private networks as well as whether the technology is used for network access or as a network backbone.

SMDS is almost exclusively targeted for public network applications. It offers a connectionless service and can be thought of as an attempt to provide local-area network-like capabilities in a metropolitan-area environment. It appears that SMDS will be more successful as an access technology and that SMDS backbone networks will likely be replaced by ATM backbones.

Frame relay and ATM are applicable for access and backbone switching in private and public nets. Frame relay has grown rapidly over the past three years, evolving from a little-known concept for packet-mode Integrated Services Digital Network capabilities to an international standard supported by many carriers and vendors. This rapid growth has been fueled by the need to develop a standard for carrying LAN traffic between remote locations.

ATM has been heralded as the technology of the future, a label it clearly deserves. It has been chosen as the core technology for broadband ISDN services. While frame relay primarily serves today's megabit communications needs, ATM addresses tomorrow's multimegabit requirements. ATM can also be used in LANs, whereas frame relay cannot.

Frame relay compares to ATM in much the same way X.25 compared to frame relay three years ago. Frame relay is essentially the next generation of X.25 that uses high-grade digital lines to offer far greater speed than X.25. ATM will use even higher speed optical lines to replace frame relay.

X.25 still dominates data communications in terms of installed interfaces and actual use. However, frame relay will likely penetrate existing X.25 nets and transform X.25 into a network access technology as opposed to a switching technology.

Likewise, one can expect ATM to transform frame relay into a network access technology. Frame relay networks carry a lot of X.25 traffic but also have direct frame relay interfaces to customer premises equipment. Similarly, ATM networks will carry frame relay traffic but will also have direct ATM interfaces to high-speed customer premises equipment.

Frame relay appears to be the technology of choice for T-1 speeds and below, while ATM is likely to dominate at T-3 and above. Frame relay should dominate for the next three to five years and give way to ATM in a five- to 10-year time frame.

While SMDS is focused on access to public network services, frame relay and ATM can be used to access public network services or build a private backbone network. Although ATM will replace frame relay as a backbone technology, this transition will take time and depend on such factors as user bandwidth requirements, tariffs for high-speed lines and the economy. Even after the transition, frame relay will continue to be used for many years as an access technology to these nets. ◻

Opderbeck is a member of the Frame Relay Forum's board of trustees and is vice president and chief technical officer at Netrix Corp.

ATM

By Steve Walters

Asynchronous Transfer Mode (ATM) is a promising networking technology that will affect most, if not all, areas of communications.

The ATM Forum, a group of vendors developing interoperability specifications for ATM products and services, believes it is inappropriate to debate the virtues of ATM vs. frame relay and Switched Multimegabit Data Service.

One or another, or possibly all three emerging technologies, may be appropriate, depending on individual user needs. Indeed, these complementary technologies address different customer needs, depending on application requirements. Ultimately, the marketplace is the arbiter; users and carriers will implement the technologies that best meet their needs.

However, it is important for each technology to be clearly understood, without hype, so that users can make intelligent decisions. SMDS and frame relay are packet-based services for publicly transporting data. ATM is also packet-like. But the ATM packet is a fixed-length cell, which allows very fast switching and multiplexing. These cells will traverse the network through permanent virtual circuits set up when a user subscribes to an ATM service or via signaling, much like telephone calls are set up today.

ATM is a network technology for next-generation local- and wide-area networks in both private and public domains. ATM is not distance-limited; ATM networks will be global. We can expect to see ATM networks being built by all types of network providers — LAN and WAN equipment vendors, as well as local exchange and interexchange carriers.

In fact, this is already happening. The ATM Forum believes ATM will be the technology platform of choice that carriers will use to build networks of the future. Indeed, the ATM platform will carry SMDS, frame relay and other services over common ATM switching equipment, which is an aspect particularly important to public network operators that must interwork with the embedded base of equipment and existing services of their customers.

Therefore, SMDS or frame relay customers can be served from both existing as well as emerging ATM network platforms. Also, ATM will enable new services.

An often-touted aspect of ATM is its ability to blend different types of traffic — such as voice and high-speed data, and time-sensitive information such as video — within the same network. This is possible because ATM cells are relatively short and would not incur significant transmission delay by waiting for large packets to pass. Also, sensitive traffic can be assigned to a quality of service class that ensures its delivery.

Therefore, in addition to carrying data

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(continued from page 49)

and to be made aware of outages or service degradation.

The first issue a user should address is the level of reporting and utilization statistics the carrier can provide. Many providers offer a variety of usage reports, something unheard of with dedicated lines.

Just how the user gains access to management statistics is another consideration. Carriers will offer report summaries on a weekly or even monthly basis. WilTel's WilPak offers a program where customers can call a service center and have reports read over the phone or faxed to them at specified intervals.

Other carriers, such as AT&T, allow users to subscribe to weekly or monthly service reports. But real-time access to management information is scarce.

Such advanced functionality would allow the customer to alter network configuration and provision new service on-line, mimicking some of the functionality of private networks. Network management capabilities among the service providers varies widely, and net managers will need their frame relay service providers to furnish management data to sustain end-user applications.

Net management functionality today remains limited. Some carriers offer a very passive form of management in which they provide basic on-line access to management information. In the future, users will be able to provision PVCs and manipulate their speeds from a terminal, but no carrier offers these functions today. They are not likely to be available soon either.

Since many frame relay applications are supplanting private-line services, end

(continued on page 62)

MCI to unveil major frame relay changes

MCI Communications Corp. this week will announce an overhaul of its frame relay service in which it will upgrade trunking speeds to T-3 rates, and unveil plans to support its Switched Multimegabit Data Service (SMDS) offering on the same backbone network.

MCI will also rename its VPDS Frame Relay offering, instead calling it HyperStream Frame Relay to reflect the close fit it is trying to achieve with its SMDS offering.

The upshot of MCI's announcement is that it will become the first major interexchange carrier to announce support for frame relay and SMDS over the same backbone. MCI is the only interexchange carrier with a 53-byte cell relay net, and its decision to boost trunking speeds to T-3 will give it the flexibility to support frame relay and SMDS simultaneously.

Direct trunking between gateways is being provisioned to handle traffic without tandeming through cell switches. These changes reduce network delay and improve the net's maximum throughput capability for customers.

The most striking point of MCI's new program is its pricing. MCI will now offer permanent virtual circuit (PVC) pricing on a mileage-sensitive basis, which will facilitate more direct comparisons to private circuits. Previously, PVCs had been priced on a distance-insensitive basis. Users will now see savings on shorter hauls but increased costs for longer distance connections.

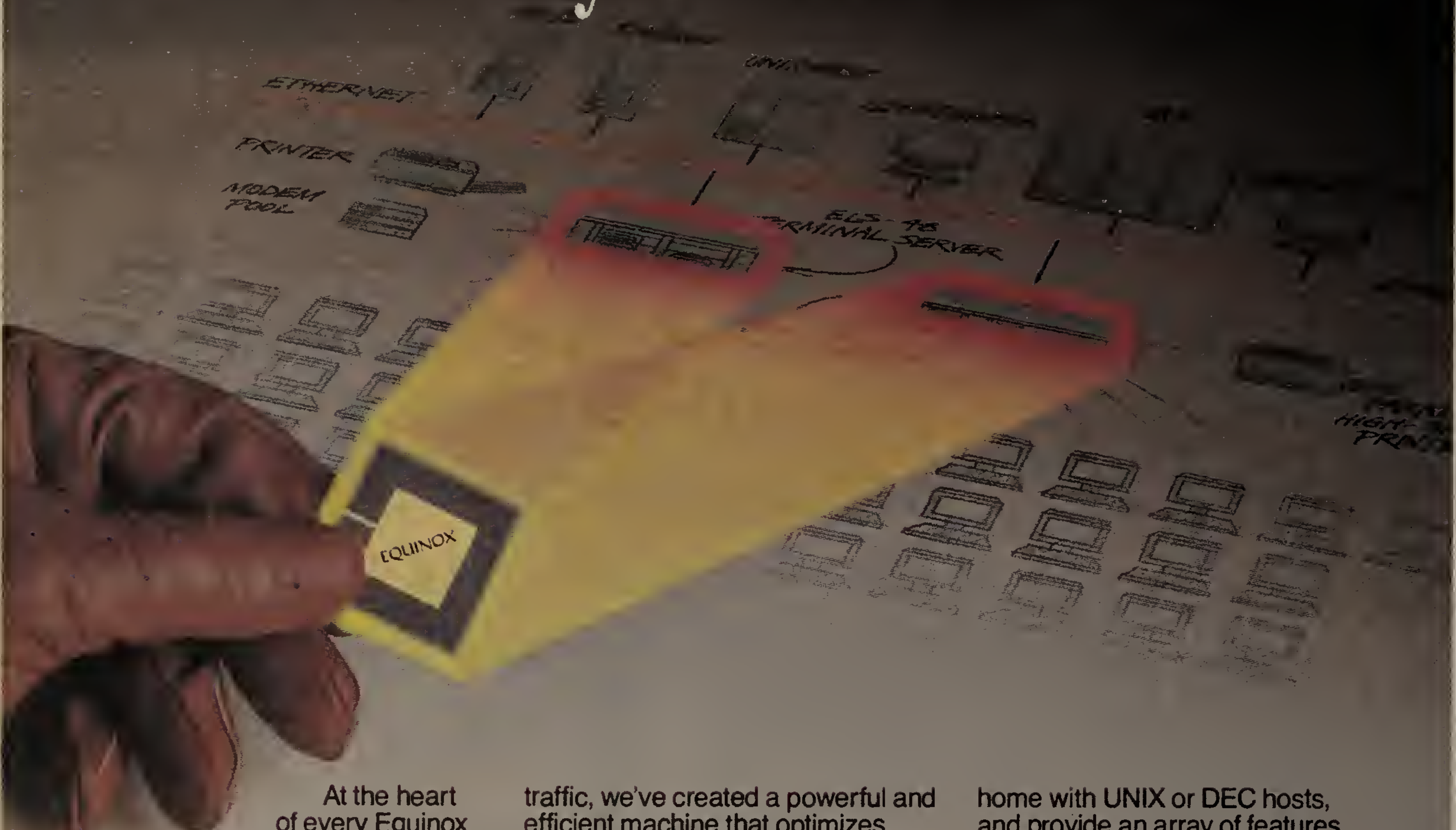
MCI will also introduce a rate option with an associated committed information rate charged on a usage basis. This makes it possible for high bandwidth, low utilization — and often one-way — applications to become widely cost-effective by reducing incremental bandwidth and connection costs.

By supporting frame relay and SMDS on one backbone, MCI will let users easily move from a connection-oriented private-line setup with frame relay to a connectionless-oriented applications environment supported by SMDS. All of the new pricing options can be used together in a single customer network, or the customer can choose different pricing methods for each direction of a PVC.

MCI will also remove the port oversubscription limit for its frame relay service, which means customers will have the flexibility to use as much aggregate bandwidth as is efficient with a single port.

In addition, MCI will announce that it is expanding its Simple Network Management Protocol management program, HyperScope, for use with several net management platforms. The service will be available starting next month.

— Daniel Briere and Chris Finn



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Circle Reader Service #21

Looking into Windows for Workgroups

By JIM BROWN and STEPHEN MATTIN

Microsoft Corp.'s recently released Windows for Workgroups could have a significant impact on the local-area network market, according to testing that shows the product meets its main objective of enabling small work groups to easily share files and other resources. However, if Windows for Workgroups is going to meet its second objective of linking those work groups into enterprise networks, it will need a much broader set of integration tools.

Testing done by *Network World* Test Alliance member Focus Software, Inc. found Windows for Workgroups is generally easy to install, administer and operate.

Windows for Workgroups — Microsoft's entry into the peer-to-peer network operating system (NOS) market — is basically Windows 3.1 with Network Basic I/O System Extended User Interface networking protocols.

Windows for Workgroups includes File Manager and Print Manager software that enables users to share files and other resources without dedicated network servers.

The package also comes with a scaled-down version of Microsoft Mail, a Microsoft Mail-based scheduling application called Schedule+ and support for network Dynamic Data Exchange (DDE), which enables users to cut, copy and paste data between applications running on different clients. Yet, it only provides links to LAN Manager or Novell, Inc. NetWare servers on an enterprise LAN.

Windows for Workgroups is the latest in Microsoft's attempt to integrate LAN capabilities into its operating systems. Microsoft will be adding even more LAN capabilities in its Windows NT, which is currently in beta test at several sites, including Focus. Windows NT will provide a platform for high-end network services, such as databases, enterprise electronic mail, network backup and file storage on LAN Manager, NetWare and Transmission Control Protocol/Internet Protocol networks.

Test results

In the testing, Focus configured three Intel Corp. 80386-based PCs as both clients and servers on an Ethernet network. To test printer sharing, Hewlett-Packard Co. LaserJet III, DeskJet 500 and DeskJet 500c printers were used. The PCs were tested with Standard Microsystems Corp. (SMC) and 3Com Corp. Ethernet adapters.

Two different adapters were used to test Windows for Workgroups' automatic adapter detection and configuration feature, which considerably simplified the process of getting the software to work with the network adapter.

When users type the SETUP command during Windows for Workgroups installation, automatic adapter detection algorithms identify the adapter type, manufacturer, model number and current adapter configuration settings, as well as the hardware interrupt and I/O port used.

Stephen Mattin

Microsoft admits that the algorithm is not always able to detect which adapter is being used, particularly when the adapter is uncommon.

The product is supposed to be able to identify adapters that use drivers conforming to the Network Driver Interface Specification and load the correct driver automatically. But if the adapter cannot be automatically determined, users must manually load the driver and examine the adapter to make sure switches and jumpers are properly set.

In the course of installation at Focus, some adapters — particularly newer SMC 16-bit ones — could not be detected correctly and the process seemed to have actually changed the adapter's software configuration, resulting in a conflict with other devices on the PC.

In one case, testers gave up trying to correctly configure an SMC WD8013EPC adapter and replaced it with SMC's more common 8-bit WD8003 model. The process went much smoother when 3Com 3C503 adapters were used.

Hopefully, automatic network adapter detection routines will be incorporated into Windows NT before it is made commercially available.

Installation

When adapter installation is complete, Windows for Workgroups' SETUP procedure prompts users to enter the name of the work group to which the PC will be assigned. A work group is analogous to a LAN Manager domain, which is also supported in Windows for Workgroups.

Multiple work groups can be set up on a single LAN. But users are only supposed to be able to gain access to their own work group resources.

However, testing revealed that PCs assigned to one work group could access resources assigned to another.

The networking features of Windows NT are very similar to Windows for Workgroups. Some of the administrative aspects require the user to log on to Windows NT as an administrator, rather than as a typical user.

Windows for Workgroups clients are able to access Windows NT servers. They also have no problem connecting to NetWare 3.11 servers. Because of time constraints, Focus was unable to test connectivity with the OS/2-based LAN Manager.

File sharing

Once assigned to a work group, users clicking on Windows for Workgroups' File Manager icon are presented with a Connect Network Drive option that contains a browser box listing all network accessible files.

Connect Network Drive enables file retrieval across the net by clicking on the file name. But the test team encountered a problem with Connect Network Drive: the seemingly random disappearance of network resources from the browser.

Each machine in Windows for Workgroups stores available resources in a cache in main memory. This cache seems to be vulnerable to becoming out of date since Windows for Workgroups nodes don't exchange configuration data as often as LAN Manager nodes in an effort to keep network broadcasting to a minimum.

There were also many instances where available resources could be accessed by specifying their name using Windows for Workgroups' Universal Naming Convention, even though the resources were not displayed in the browser. This cache eventually gets synchronized with reality, but providing a way to force its updating manually would help.

Besides the Connect Network Drive option, File Manager includes a Share As option that lets users list the files they will make available to other users.

There are three possible ways users can control access to their files via Access Type settings. The default setting is Read Only, which enables remote users to view but not change a file. Full Access allows remote users to view and change files as well as reconfigure file settings or subdirectories. The third option adds a level of security to file access. The Depends on Password setting enables users to require a password be entered before Read Only or Full Access can be attained.

PHOTOGRAPHY ©1993 BILL O'CONNELL

Furthermore, one password can be required to gain either Read Only or Full Access. Alternatively, one password can be required for Read Only access, while a different password can be required for Full Access.

Users can configure their PCs to automatically insert their password when accessing files. While the security features worked well, Windows for Workgroups lacks user authentication.

Authentication would make sure the proper person is accessing the network, not just someone who has a stolen password or is using a PC that automatically inserts the password. This is in contrast to Windows NT, which has much more elaborate security features based on user authentication and group membership.

Printer sharing

Locally attached printers may be shared with other Windows for Workgroups PCs, although the correct printer drivers must be installed on every machine that will access the printer. This is in contrast to Windows NT, where only the machine connected to the printer needs the proper printer driver installed.

Windows for Workgroups contains the same wide variety of printer drivers as Windows 3.1.

Connecting to a remote printer using Windows for Workgroups is simple. A browser box that pops up when clicking on the Print Manager icon lists available network printers. Users can select which printer to use by clicking on the name of the printer, and as long as the driver for that printer is installed on the PC, files will be directed to that printer.

The need to install drivers for network printers on every PC makes printer sharing in Windows for Workgroups much more difficult than seems necessary. This requirement can be avoided by storing the library of printer drivers on one PC in the Windows for Workgroups network and making those files accessible to all PCs. This will enable each PC to have the driver for the printer it uses most often, and simply download the driver for other printers as needed.

Windows for Workgroups' Print Manager provides nice printer queue information that indicates the source machine of each job, which is not the case with the current Windows NT beta release.

Remote printing between Windows for Workgroups machines worked most of the time, but testers experienced a few lost print jobs that simply never showed up in the remote printer queue. It is still unclear what caused those jobs to be lost.

Network applications

To make Windows for Workgroups more useful, Microsoft has bundled several net-based applications with the product, including a limited version of

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Microsoft Mail Version 3.0 and Schedule+. The E-mail program enables users to create a post office on either Windows for Workgroups servers or clients. But these post offices cannot be connected to post offices or E-mail gateways running on other machines. This means that post offices set up to support separate work groups will be unable to exchange E-mail, and, therefore, users in different work groups cannot exchange E-mail.

Users can obtain this cross-post office function by upgrading to the full Microsoft Mail product or by attaching the Windows for Workgroups E-mail client to the post office of a full-featured Microsoft Mail server. But with the E-mail client in Windows for Workgroups crippled by a missing spell checker, tutorial and help index, most users would install the full Microsoft Mail client on Windows for Workgroups PCs when linking to a full Microsoft Mail post office.

The only problem noted when exchanging E-mail, aside from those due to functional limitations, was the unexpected storage of messages in the local Windows for Workgroups directory rather than on the PC acting as the post office. This means that if users switch Windows for Workgroups machines, their mail is stored on that machine rather than their own.

The Schedule+ application worked well, updating calendars when group appointments were made.

Network DDE

Support for Network DDE is the enabling technology for a network Chat program that provides two-way text communications. When using Chat, two windows pop up on the user's screen. One is used to type in text destined for the remote PC, while the other displays text received from the other PC.

Chat appears on the screen as a telephone icon. Users wishing to establish a Chat session click on the CALL command in the Chat menu and type in the other user's name. The phone on the other user's screen starts jumping around to prompt the user to click on the ANSWER command in the Chat menu. To end a session, both users click on the HANGUP command.

Chat also includes an Edit Menu that enables users to cut, copy and paste text from other files into Chat windows.

Network DDE support also enables a new Clipbook Viewer application, which subsumes and extends the features of the Windows 3.1 clip book. This feature enables users to cut or copy text, graphics and linked objects such as a Microsoft Excel spreadsheet chart from a file and paste them onto a page in the clip book. Users can then share clip book pages in much the same way Windows for Workgroups enables them to share files.

Windows for Workgroups also includes a new NetWatcher accessory that enables users to see which other users are connected to their PCs and forcibly disconnect any of them. With NetWatcher, users trying to exit Windows for Workgroups will be asked if they want to disconnect any user connected to the PC.

Disconnecting users when exiting the program is the Achilles' heel of peer-to-peer networking. Running a successful peer-to-peer network presupposes cooperation between the people involved. If local PC resources are shareable, the machines will likely have to remain on, even when their owners are absent, which also has considerable security implications.

Lastly, the Windows for Workgroups Resource Kit has WinMeter and NetMeter applications that provide CPU utilization statistics for local and remote usage.

Conclusions

Microsoft is marketing Windows for Workgroups fairly well, too. Windows 3.1 users can upgrade to Windows for Workgroups for $99.95. Microsoft is also offering a $849.95 bundled package for new users that consists of two copies of the software, two Intel Ethernet adapters and 25 feet of coaxial cable.

While testing revealed several problems with Windows for Workgroups, they were fairly minor and could be overcome. This software will take a long time to mature, and Microsoft seems to be well on the way to transforming LAN Manager from a noncontender in networking into a heavyweight champion, although it should probably drop the LAN Manager name, which has a poor technical reputation. ◘

Brown is the managing editor of features at Network World, *and Mattin is chief engineer at Focus Software, Inc.*

Testing was conducted at Focus Software, Inc.'s Salem, N.H.-based laboratory. Focus provides network software testing and consulting services to end users and vendors. The company can be reached at (603) 890-1000.

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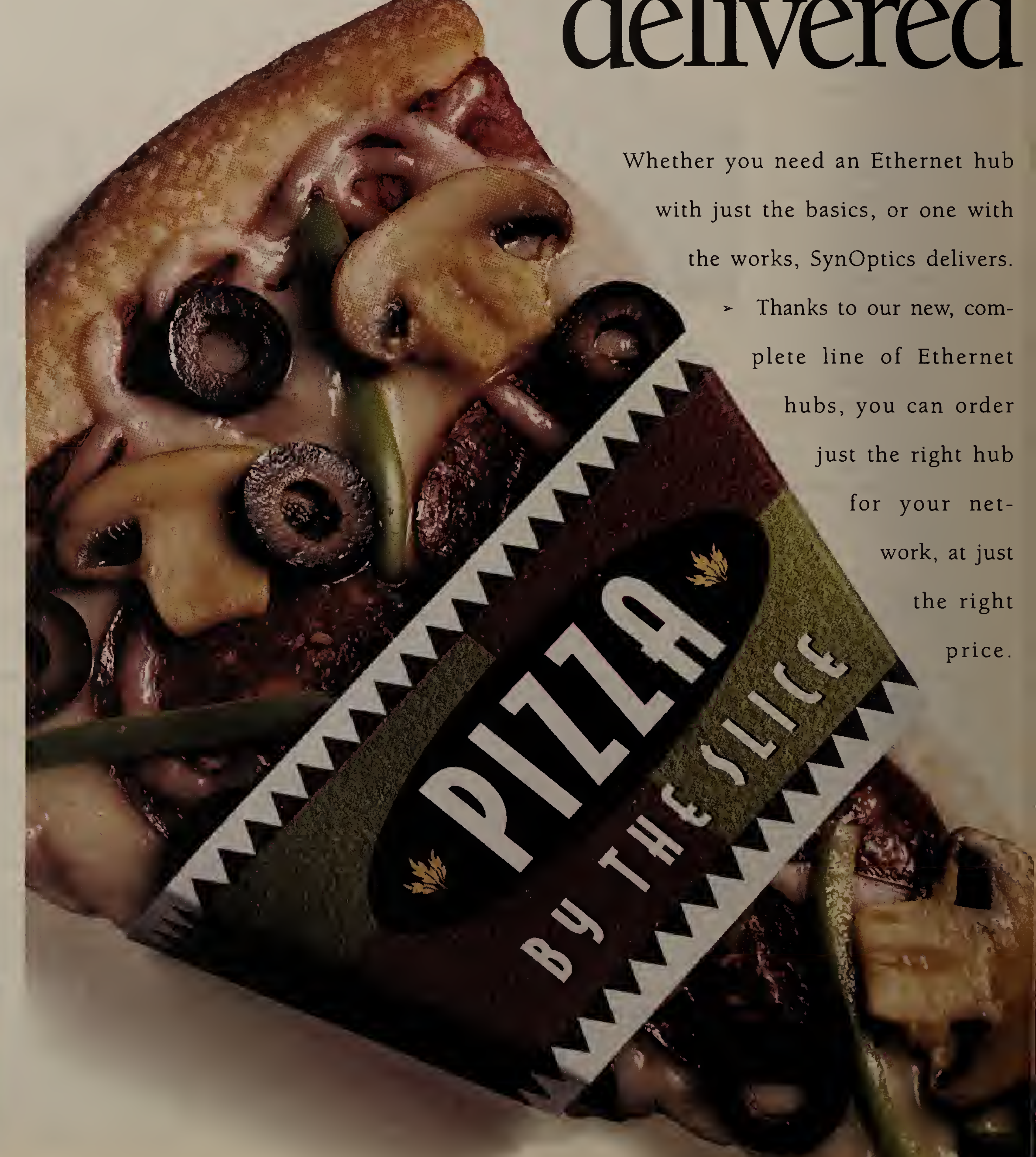

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Users speak about service and support

continued from page 1

work budgets on internal service and support, and another 10% on external service.

While the survey showed users don't expect to increase their external support spending much in the next two years, vendors that tune their service options to meet user needs better could take a bigger chunk of the budget pie, said Jeff Kaplan, a director at the Dataquest Worldwide Services Group, a division of Dataquest that focuses on service and support.

Network executives interviewed for the survey have average annual network budgets of 5.1 million and purchase approval for network products and support services. On average, they manage corporate nets supporting 37 sites and have a support staff of 25 people.

Internetwork surprise

According to Kaplan, the surprise finding of the survey is that users gave top billing to the service and support provided by their bridge, router and hub suppliers.

About 63% of users said internetwork vendor service has improved in recent years, while only 5.2% said it had gotten worse. LAN vendor service has improved according to 55% of users and worsened according to 9.2%. Service has improved among WAN vendors according to 63% of users but gotten worse in the opinion of 10.3%.

The high marks for internetworking vendors are surprising because these vendors are still building their service infrastructures — something other vendors have had more time to work on. Internetwork vendors may also have an edge over LAN suppliers because most do not rely as much on resellers as LAN vendors do for sales and support.

"Resellers can be unpredictable with service and support, and it's not always easy for vendors to track this," Kaplan said. "Internetworking vendors will be challenged to keep up their service and support levels as they start selling bigger volumes of products and need to enter into new relationships with resellers."

Internetworking vendors rated particularly high on responsiveness to problems, but even there, they have their work cut out for them. Users indicated that they hold internetworking vendors to even higher standards than LAN and WAN vendors (see Figure 3, page 59).

> The surprise is users gave top billing to the service and support provided by bridge, router and hub suppliers.

▲▲▲

Currently, it takes internetworking vendors 4.4 hours to return a user's first call for help. That's better than LAN and WAN vendors — which take 5.3 hours and 5.1 hours, respectively — but still twice as long as what users expect.

It takes internetworking vendors about 5.7 hours to resolve a problem over the phone, whereas it takes LAN vendors nearly 9 hours and WAN suppliers 6.7 hours to do the same.

Also, when users were asked to name their biggest problems with outside support providers, poor responsiveness was cited less often for internetworking vendors than other vendor groups.

As a group, internetworking products received higher performance ratings than either LAN or WAN products in all catego-

(continued on page 58)

This survey was conducted in conjunction with the Dataquest Worldwide Services Group, a division of Dataquest. Dataquest is a market research and consulting subsidiary of Dun & Bradstreet Corp.

The Dataquest Worldwide Services Group (formerly Dataquest/Ledgeway) has tracked the worldwide information technology service and support industry for more than 10 years. The company offers 11 annual subscription services, which provide market studies, competitive analyses and customer research services that meet the needs of business planners, marketers and senior management at more than 100 leading information technology vendors in the U.S., Europe, Japan and the Pacific Rim.

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(continued from page 57)

ries: quality of service, reliability, ease of use and documentation.

The internetworking group gets its lowest ratings in the areas of documentation and ease of use but still scores better overall than LAN and WAN vendors in those categories.

Still, some users say they would like to see internetworking vendors do more up-front testing of products in multivendor environments.

"Sometimes it appears the products aren't being tested in the types of environments they're being sold into, and we've had to pay the price for that," says Al Rossi, an advisor at Bristol-Myers Squibb Co., a Princeton, N.J., pharmaceuticals firm.

LAN vendors: ups and downs

Compared to the internetworking vendors, service from LAN vendors is erratic, the survey finds.

Users give LAN products, such as adapter cards and servers, good ratings — averaging better than 4 on a scale of 1 to 5 — on overall reliability.

Big problems

Figure 1

Users rank their single biggest problem with internal and vendor-supplied service/support

Internal service/support	LANs (%)	Internetworking (%)	WANs (%)
Lack of multivendor expertise	35.7	44.4	47
Lack of qualified staff	24.5	21.2	21
Inability to develop and support network applications	11.2	9.1	8
Retaining staff	7.1	7.1	5
Costs rising too fast	7.1	6.1	12
Other	14.4	12.1	7
External service/support			
Lack of multivendor expertise	35.4	38.9	37.4
High cost of services	14.6	14.7	15.2
Lack of qualified staff	13.5	9.5	14.1
Poor responsiveness/timeliness	10.4	9.5	8.1
Poor documentation	8.3	7.4	12.1
Lack of training	4.2	3.2	3
Lack of thoroughness	6.3	5.3	8.1
Other	5.2	9.5	2
None/no response	2.1	2	—

But network operating systems earn the lowest ratings of all LAN, WAN and internetwork products for documentation quality, overall service and ease of use.

"I might have five or six manuals for the same product, which makes it hard to solve a problem right away," says Tom Heldridge, project coordinator at Mutual of Omaha Insurance Co. in Omaha, Neb. "I'd like to see them spend a little more time on centralized indexing."

Like other vendors, LAN vendors get hammered on lack of multivendor support, lack of qualified staff, high costs and responsiveness.

In fact, users say it took LAN vendors longer to respond to problems in three of four responsiveness categories. For example, LAN vendors take more than 50% longer than internetworking vendors to resolve problems via phone.

Michael Malarkey, senior systems analyst at the Federal Deposit Insurance Corp. (FDIC) in Washington, D.C., wants a faster way to get in touch with the right people on his vendors' support staffs. The FDIC often relies on LAN vendors to solve complex network problems that cannot be handled internally.

Rating overall vendor performance

Figure 2

	Quality of service	Documentation	Ease of use	Reliability
DSUs/CSUs	1 (+)	7	3	1 (+)
Modems	2	1 (+)	1 (+)	5
T-1/T-3 muxes	3	7	6	7
Routers	4	2	7	4
Wiring hubs	5	1 (+)	2	3
PBXs	6	5	10	11
Bridges	7	6	8	9
Adapter cards	8	3	4	2
Subrate muxes	9	8	6	10
Servers	10	4	5	6
Packet switches	11	8	9	11
Superservers	12	7	11	9
Inverse muxes	13	8	10	12 (-)
Network operating systems	14 (-)	9 (-)	12 (-)	8

Relative ranking of vendors based on average user ratings. Plus (+) and minus (-) indicate highest and lowest ranking in category.

"I think the vendors have qualified people," Malarkey says. "But they'll often need to send in a few people before they send the right one. It's a matter of going through several layers."

Some LAN vendors need to customize their support offerings, Malarkey says. Because Banyan Systems, Inc. tends to cater to enterprise network accounts, Malarkey says the company seems to be less well equipped to handle issues regarding smaller VINES implementations, such as his division's net.

In general, users say they would like to see their LAN vendors respond at least twice as fast to problems.

Users say they need LAN vendors to arrive on site to fix problems in 4.8 hours, whereas it takes an average of 10.1 hours now.

Wide world of support

Individual WAN vendors, such as those selling modems and data service unit/channel service units (DSU/CSU), excel in some areas, whereas the overall WAN industry falls down in other areas of responsiveness to problems,

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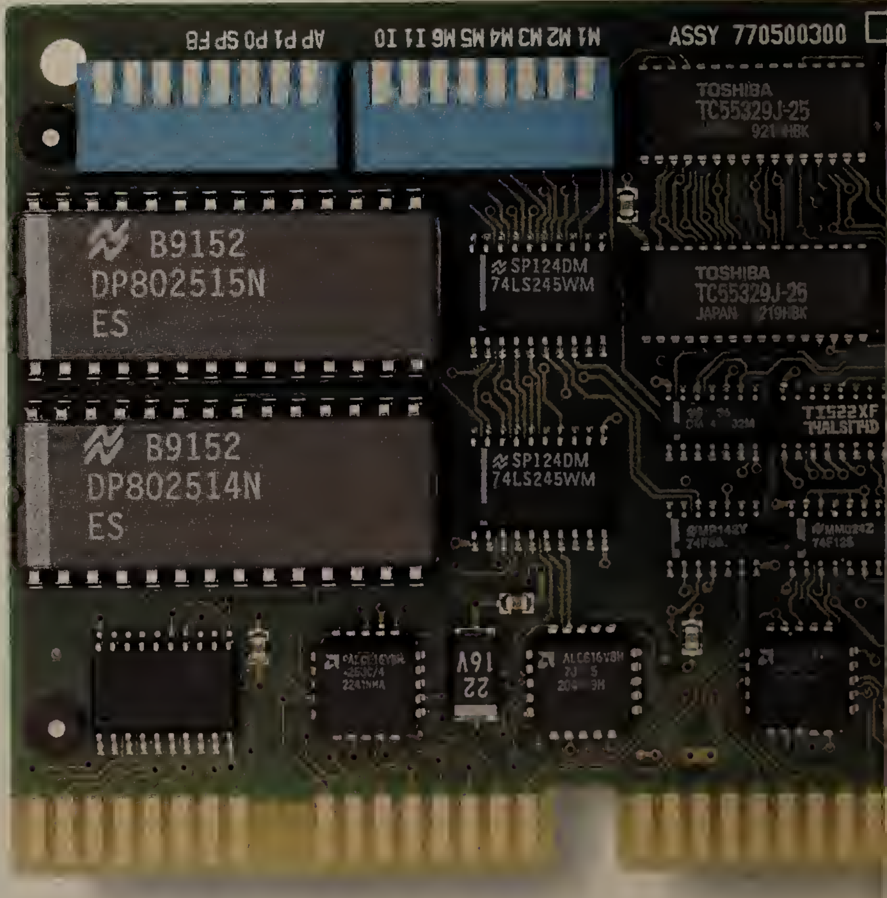

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high costs and multivendor support.

Users give modems the highest ratings of all network products for both documentation quality and ease of use. DSU/CSUs capture top honors for quality of service and reliabilty.

But WAN suppliers fare poorly in getting on-site to fix problems. Users say they want vendors to arrive in 5.4 hours, rather than in the average 11.5 hours it now takes.

These vendors are also deemed to be the weakest in the area of multivendor support, and some 14.1% of users point out a lack of qualified staff as being the biggest problem with WAN vendor support.

John Smart, personal computer LAN manager for The Limited, Inc., a Columbus, Ohio-based retailer, says T-1 multiplexer vendors, for example, need to improve their knowledge of LAN technologies to provide better service.

"The whole industry needs a solution for the lack of experienced network professionals," Smart says. "Due to the extremely high growth rate in the industry, though, it's easy to understand why there's a problem."

More users (15%) cite high costs as a big problem among WAN vendors than either LAN or internetworking vendors.

Wendell McCarty, network manager for the University of Kentucky in Lexington, says he might be willing to go to vendors for support more often if the prices were lower. Severe budget cuts at the university are making it difficult to retain a qualified internal staff, he says.

A network manager at a large bank who asked not to be named says he would like to see vendors offer a bigger variety of support pricing options.

"After we've spent all this money buying equipment from the vendors, it seems like the least they could do is train us how to fix it without charging us huge sums," he says.

Vendors should at least try to bundle service and training costs into the overall equipment price so that users do not have to ask upper management for funds twice, the net manager says.

"It's an up-front thing that way," he says. "Once you go out and spend $15,000 on equipment, it's tough to go back and ask for tens of thousands more to teach people how to use and fix it."

New service options

Users are nearly unanimous in applauding multivendor technical support alliances. These alliances are rated as very important by 64% of users and important by another 32%.

Multivendor service alliances among vendors, such as those initiated by Novell, Inc. and last week by 3Com Corp. ("Vendors expanding service to woo users," page 19), involve cross-training between vendors on each other's products, support for service standards and other cooperative agreements.

"We'd like to be able to go to somebody with the expertise to solve problems relating to the overall network," Mutual of Omaha's Heldridge says. "We'd like to see some of the equipment vendors get together as some of the software vendors have."

The University of Kentucky's McCarty says, "It would be nice if the vendors knew how they interconnected with each other. It would save us from having to fight to get that information when a problem occurs."

Once vendors have fixed a multivendor network problem, they need to have systems in place to automatically notify their own developers and other vendors of how the problem was resolved, says Bruce Schmidt, network manager at the Teachers Insurance Annuity Association-College Retirement Equities Fund in New York.

"I don't think the word always gets back to product developers and other vendors who need to address the problem in future product releases," Schmidt says.

Another emerging service option users highlight is remote diagnostics and maintenance, which involves letting vendors tap into your systems remotely to isolate and fix problems. More

(continued on page 60)

Service makes a difference

Figure 4

Factors affecting first-time network equipment purchases and decision to change vendors

	First-time purchase	When considering a vendor change
Quality of vendor's service	3.83	3.88
Price/performance	3.46	3.43
Product features	3.48	3.47
Vendor's reputation	3.33	3.42

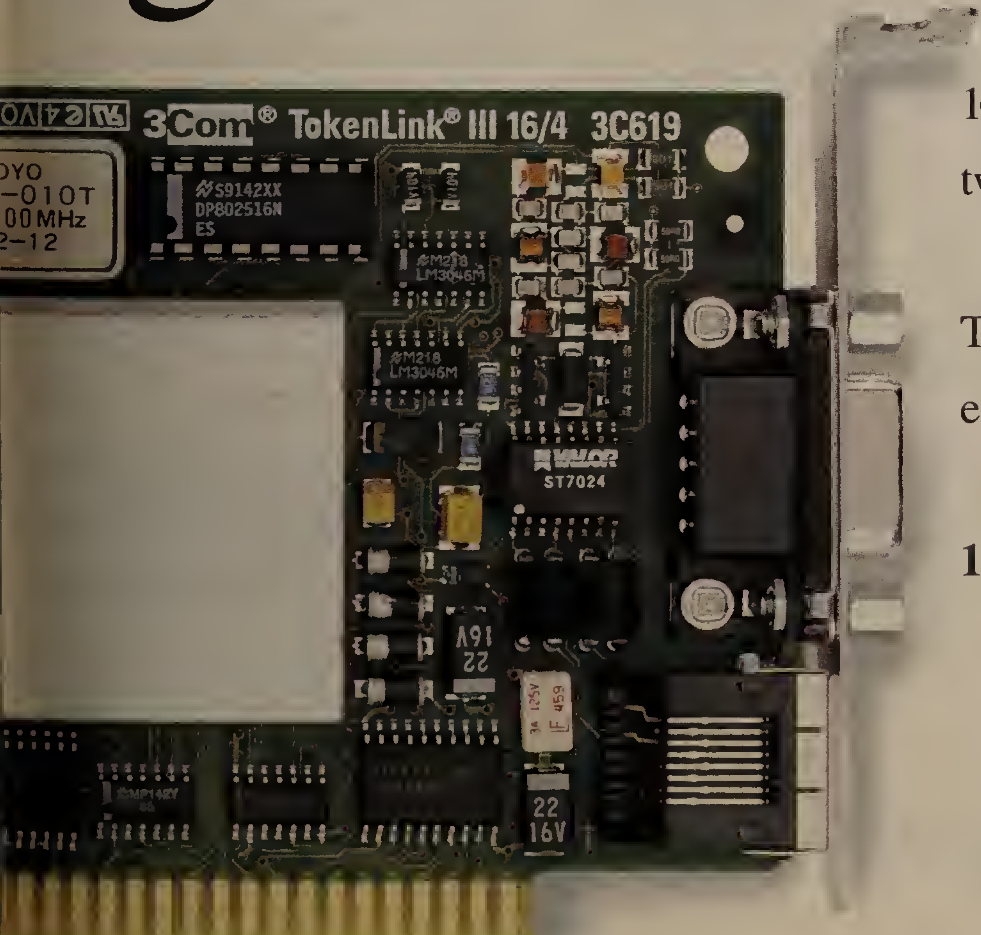
*Based on a scale of 1 to 5
1 = Not important 5 = Very important

Calling for help

Figure 3

Average vendor response time (in hours) and what users would prefer

Vendor responses	LANs	Internetworking	WANs
Return call after first call for help	5.25	4.37	5.09
(Preferred)	2.06	1.77	1.83
Resolve problem via telephone	8.97	5.66	6.74
(Preferred)	2.74	2.36	2.43
Arrive on-site to fix problem	10.12	10.82	11.50
(Preferred)	4.75	6.21	5.39
Fix problem once on-site	8.74	7.92	8.14
(Preferred)	5.18	5.12	4.14



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(continued from page 59)

than 91% say this is an important or very important option for speedier service and support.

But about half of the respondents express security concerns, saying they would be "uncomfortable" or "very uncomfortable" with remote monitoring. Overall, users say they are most comfortable allowing their WAN product vendors to remotely monitor their networks and least comfortable with internetworking vendors doing the same.

"I don't doubt vendors can provide faster service by remotely monitoring networks," the FDIC's Malarkey says. "But I have sensitive data, and sometimes you need to balance security against response time."

A network manager with a large bank acknowledged that remote monitoring could cut problem response time but says his company has been turned off to the practice. "Security is a concern, but we also had a hardware vendor that rebooted its system at a time when we needed our network to stay up, and it caused a problem," he says.

The Limited's Smart says he would like to see more vendors start using electronic mail or electronic bulletin boards to communicate with users.

R.A.F. recommendations

The survey highlights a number of areas in which vendors must improve their service and support offerings to keep pace with changing user networks.

Topmost is the need for a higher level of multivendor service and support. Vendors need to invest in staff training on a variety of network platforms and applications, and forge alliances with other vendors for cross-training and support.

LAN vendors have already taken the lead here — Novell's Technical Support Alliance is a good example of what can be achieved. Internetworking and WAN vendors need to consider involvement with existing alliances and perhaps even formation of internetwork- or WAN-specific groups.

In general, vendors need to improve the timeliness of their service offerings. To provide better phone service, vendors need to improve the quality of their help desks, invest in more 800 lines and give users an option to get out of voice mail so that they can speak to a live representative. To provide better on-site service, vendors need to hire more local support staffers and get enough up-front information to send the right person for the job.

> Vendors need to hire more local support staffers and get enough information to send the right person for the job.
>
> ▲▲▲

Vendors are on the right track with remote monitoring from a central site as a cost-effective, fast way to resolve problems. But they need to find ways to assure users that the systems are secure and will not affect the everyday operation of their networks. According to Kaplan, customer testimonials in this area should be exploited by vendors.

Seemingly mundane issues, such as the quality of documentation, should not be overlooked either. Users have asked for indexes of product manuals since leafing through multiple manuals for different versions of products is too time-consuming. Vendors also need to provide on-line documentation or other formats based on unique customer needs.

Even the most reputable vendors with the best, most cost-effective products are not really serving their users unless they have the service to match. ◼

Telephone interviews for the "Network Service and Support Survey" were conducted in December by First Market Research among a random sample of readers.

Respondents met the following criteria: network management or MIS job function, involvement in the purchase of network products and support services, and having 50 or more end users on site.

Two versions of the survey were used — one for respondents with local-area network/internetworking responsibility and one for managers with wide-area network responsibility. For each, 100 interviews were completed.

First Market Research is an independent market research company based in Austin, Texas. For more information about the firm, call (512) 451-4000.

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VTEL rushes toward videoconferencing

continued from page 2

ment by CLI, which is expected to unveil a low-cost videoconferencing unit called Eclipse on Feb. 23 (see graphic, this page).

Sources said the Eclipse will be a cart-based system that relies on chip technology similar to that used in the Picturephone CLI developed with AT&T. It is expected to support the Px64 standard as well as proprietary technology. Sources added that new users will be able to set up an Eclipse videoconference in less than 10 minutes. CLI declined to comment.

"They're trying to throw a shadow on the Eclipse," said Elliot Gold, president of TeleSpan Publishing Corp., a consultancy and publisher of a videoconferencing newsletter based in Altadena, Calif.

Gold said VTEL's strategy differs from the other major players in that its systems are based on a standard, open PC-based architecture. "This means that its systems can work with regular PC software, which enables them to handle graphics and other information more easily during a conference," he said. PictureTel and CLI require that PC-based information be added to a conference via separate data ports.

VTEL's new DeskMax consists of a 486-based PC outfitted with a video compression/decompression board, a card for audio and communications processing, and a video display board. The system has a stand-alone speaker, a video camera/microphone unit that sits atop the PC and one auxiliary audio and one auxiliary video input port for hooking up devices such as cameras or video cassette recorders.

DeskMax, which will be available in the third quarter, comes with Microsoft Corp. Windows-based software that lets users control the image on their screen using mouse-driven pan, tilt and zoom commands, said Dick Moeller, chairman of the board and chief executive officer of VTEL. It supports Common Intermediate Format Resolution of 352 pixels by 288 lines and uses transmission facilities ranging in speed from 56K to 384K bit/sec.

The company said it will roll out other wares later in the year.

TrueTalk 7 is software that supports audio at 7 kHz, vs. 3 kHz offered on current systems — an improvement comparable to the difference between an AM radio signal vs. that for a phone call, Gold said. The capability will be standard on VTEL wares shipped after the second quarter. Upgrading current systems costs $2,500.

A new camera called SmartCam will come standard with systems shipped after the second quarter, offering software-controlled pan, tilt and zoom functions as well as improved focus control. Current users will be able to upgrade for $6,000.

Videoconferencing price war

This month, 3 major U.S. vendors are announcing systems costing less than $20,000, a significant cut from the previous average system price of about $50,000.

Vendor	Product	Price	Availability
PictureTel Corp.	Model 150	$18,500	March 1
VTEL	DeskMax	$14,950	3Q
Compression Labs, Inc.	Eclipse	Less than $20,000	2Q or earlier

ATM

continued from page 51

at a typical rate of up to 155M bit/sec, ATM is expected to transport traffic not envisioned for SMDS or frame relay. Namely, ATM will support transmission of video, high-quality audio and voice. Networked multimedia applications that integrate all of these services will be best served by ATM because a single network can carry diverse traffic types.

This is one reason why many workstation vendors envision using ATM to carry multimedia applications between workstations, which means that only one network interface is needed.

Also, time frames for the availability of each technology vary. Frame relay and SMDS services are being introduced widely, while ATM products are only now becoming available. Currently in the marketplace are ATM interface cards for workstations, LAN hubs and other switching devices.

Today's communications networks and services, including frame relay and SMDS, are migrating toward a multiservice, all-speed network that will form a new worldwide telecommunications infrastructure based on ATM technology. Such networks will evolve to meet users' voice, video, data and imaging needs.

Walters, an ATM Forum executive board member and the executive director of advanced network technology at Bell Communications Research, submitted this opinion, which reflects the collective view of ATM Forum members.

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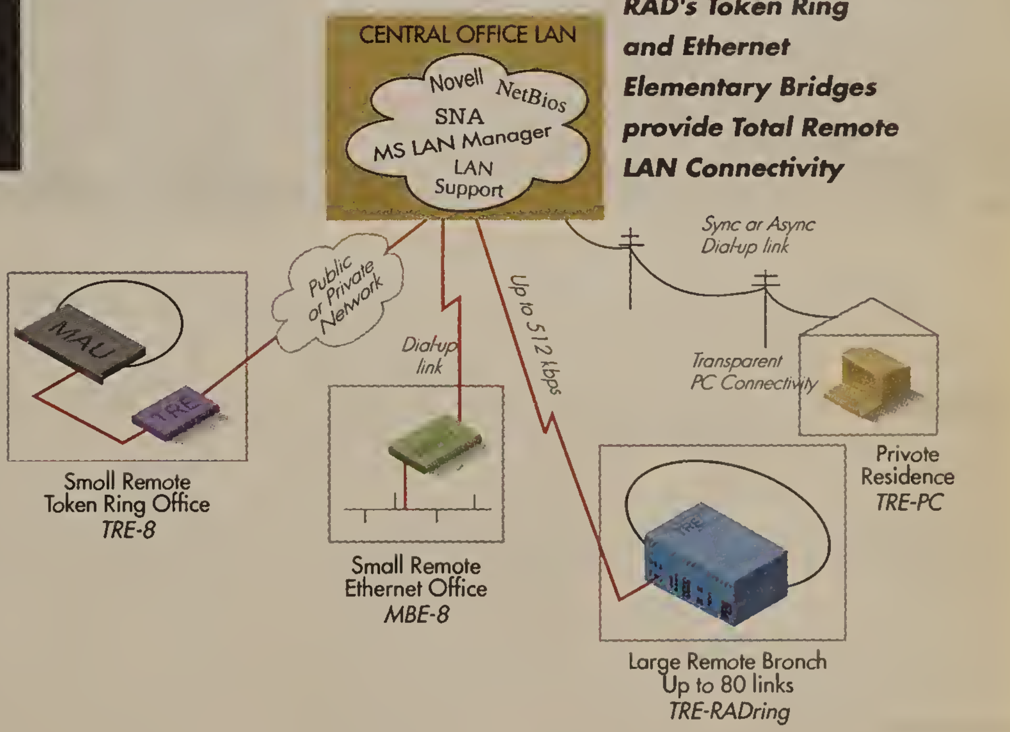
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Circle Reader Service #26

"See us at ComNet East, February 2-4, Booth 2714"

(continued from page 54)

users are looking for physical link management reporting similar to what they get with private-line services today. Users also want data link information that was not available previously, such as utilization updates.

To a large degree, availability of circuits and utilization statistics for frame relay service have been lacking. In response to repeated customer requests, the carriers have launched increasingly informative reporting platforms to report on network performance. StrataCom released its StrataView Plus management system, which gives carriers offering service from the StrataCom platform — such as AT&T, CompuServe, WilTel and BT — access to extensive network information.

Initially, this data was required simply to validate the performance of frame relay relative to private-line service. Now that users are becoming more comfortable with frame relay as a proven option, performance figures are used more for troubleshooting and capacity planning.

For many customers, these options are all that is needed, although some require more. Some customers would like to fully integrate their frame relay service into their enterprise network management structure through on-line access to carrier systems.

AT&T, MCI offerings

To address these higher needs, some carriers — such as AT&T and MCI — are developing management applications that will allow customers to manage their frame relay networks via existing SNMP management terminals.

AT&T's Customer Network Management Service has been generally available since October 1992. It gives the customer access to view performance, utilization and trouble reports. If necessary, AT&T will also supply an NCR Corp. StarSentry Unix workstation as the management station platform.

MCI has announced its customer network management application HyperScope, which can also ride on an existing SNMP management terminal; that product will be generally available this March and will offer utilization, availability and exception reporting. BT is testing its Open Systems Interconnection-based Concert terminal for on-line access to frame relay information. BT uses the same terminal internally to manage its services.

Support issues

One of the less clear criteria in evaluating frame relay service is the degree of responsibility the carrier takes in planning, implementing and maintaining the customer's network. This is probably the primary differentiator of service today and will grow as the transmission component of frame relay becomes more of a commodity.

Providers are offering a range of options for customers. All will provide design validation and implementation support as part of the sales process. Each has developed partnerships with equipment suppliers to offer equipment, such as data service unit/channel service units and routers on either a purchase or lease basis.

AT&T has gone a step further with its Extended Connectivity Option. This places routers on the customer premises which AT&T manages from its central frame relay Network Control Center in Plainfield, N.J.

At this week's ComNet '93 in Washington, D.C., WilTel will announce its WilPower line of internetworking services, including a turnkey full-service network that encompasses all aspects from design and equipment configuration to ongoing management and maintenance. WilPower services include provisioning of internetworking equipment, network configuration assistance and utilization reports. Other carriers offer similar options on an individual case basis.

Hidden pricing

Users have expressed great frustration in trying to compare frame relay services on a cost basis. In fact, in attempting to gather pricing information for this Buyer's Guide, every service provider declined to offer price data unless they were allowed to view competitors' rates.

The pricing problem is due largely to carriers breaking down frame relay pricing differently. Some bundle access support along with equipment and line fees into one price, while others have different implementations of CIR and price it accordingly.

In lieu of actual pricing, the Buyer's Guide chart lists the different types of charges providers assess for their services.

In general, frame relay pricing includes three or four components: ports, PVCs, optional hardware and support. Pricing on each of these components is rarely standardized; it varies according to the customer and carrier. For instance, the amount of carrier support services, such as network

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design and installation offered, depends on the carrier and customer.

Some carriers bundle support as part of the overall program; others charge for this as an added feature. Value-added net providers, such as BT and CompuServe, tend to offer complete packages, while carriers such as AT&T offer customers service elements on an a la carte basis.

Also, carriers offer PVCs in varying increments. CompuServe offers service down to 4K bit/sec increments. Other carriers usually offer both port speed and PVCs in 56K and 64K bit/sec increments.

A second and more visible issue that muddies head-to-head pricing comparisons simply has been the lack of available information. Some carriers — most notably AT&T — have chosen to offer the service on a contractual basis and not reveal pricing information to the public. Other carriers, such as Sprint, BT and CompuServe, publish pricing sheets. But even these carriers will sometimes stray from standardized pricing, so their public information should only be used as a guideline.

At the BOC level, services are offered under public tariffs. Most offer two speeds for both port connections and PVCs: 56K/64K bit/sec and 1.5M bit/sec. Pricing is basic and encourages customers to provision a high degree of mesh networking by pricing additional PVCs as low as $5 each per month. Some BOCs are bundling access costs making the products distance-insensitive.

On the horizon

The past year has been one of great change for frame relay services, and 1993 promises just as much change. The most visible difference will be the proliferation of frame relay in the local loop as BOC services become available. The BOCs are pricing these services aggressively with six-node networks going for as little as $1,700 per month.

In the past year, the Frame Relay Forum has also inked several frame relay standard additions, which are becoming hot issues. Two in particular are the NNI and the SVCs.

Theoretically, the NNI allows for the standardized interconnection of separate frame relay networks — either between carriers or between a user's private network and a carrier — and sets up a method for passing information between the networks.

This development should benefit users in many ways. The most obvious application is interconnection of a BOC's service with an interexchange carrier's service. Customers could interconnect all locations within a local access and transport area and, in turn, connect that network with the interexchange carrier's network through a single connection. This is sure to minimize access costs.

There has also been much talk about SVCs. Currently, customer locations are connected through static PVCs. A frame relay network with five PVCs would allow customers to call anywhere on those five PVCs, but nowhere else. SVCs would allow a customer to set up a frame relay call on demand and contact anyone on the carrier's network or any other interconnected network.

But SVCs are not that simple. "You still have to configure your routers to know who is a good guy and who is a bad guy," says John Coons, director of network services at BT North America in San Jose, Calif.

"You do not want to lose the private networking aspect of frame relay by allowing anyone to call anyone. There has to be security on the networks," Coons says, adding that by configuring routers appropriately, customers can control who can send data to their site.

However, there certainly is strong demand for SVC functionality from end users. "If the carriers make it available, we will find a way to use it," says John Mattheson of Sybase, Inc.

From exotic to reliable

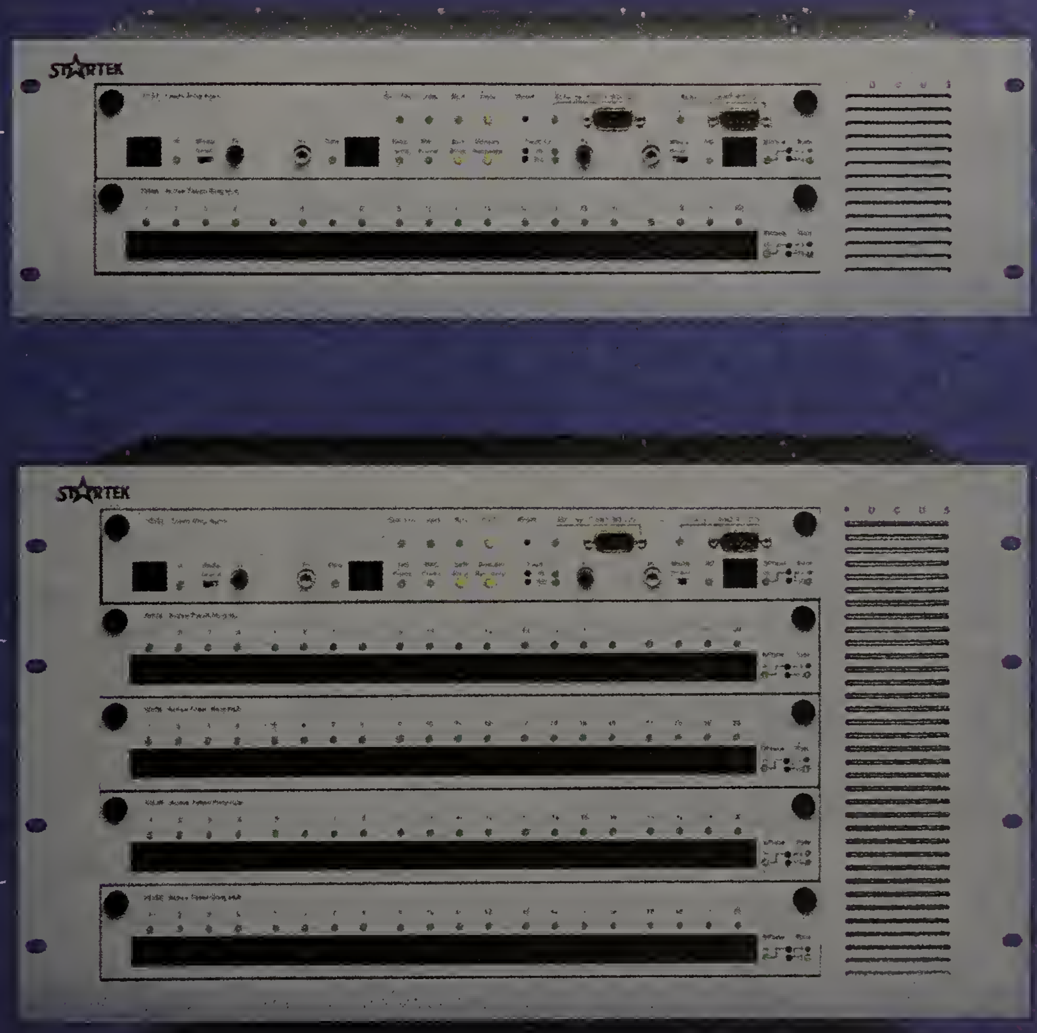
Frame relay has gained acceptance in the only way that really matters: People are using it. It has passed the point where users are questioning its viability. The fact is that frame relay excels at handling mundane but completely necessary bandwidth requirements.

Frame relay service may not be as exciting as some of the racy emerging services, but in enterprise networking, excitement is not as important as getting your data from Point A to Point B.

Frame relay, once exotic, is now a reliable, cost-efficient way to move your data. As one WilPak user says, "I read about ATM, but I am using frame relay." ◻

Briere is president of and Finn is an associate with TeleChoice, Inc., a Montclair, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. They can be reached at (201) 746-0200.

Focus On Token Ring



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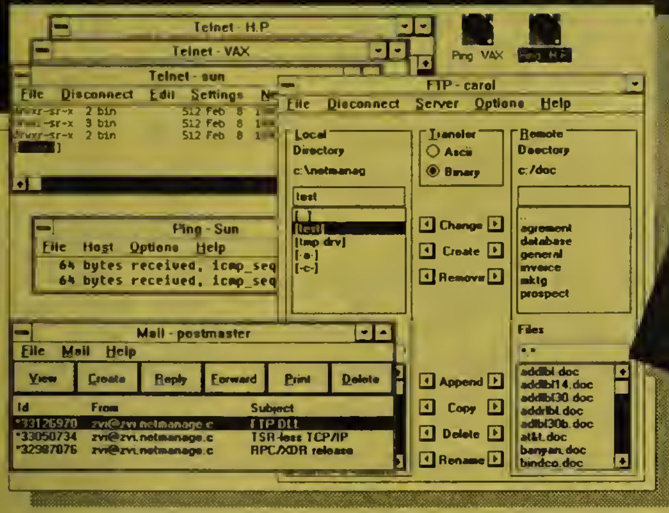

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```
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No files selected
E:\
 WIN31
  DISTFREN
  DISTINCT
  ICONS
  MAKEHELP
  SCREENS
_DEFAULT.PIF     ANSEL.INI      BUICON1.BMP
3270.TXT         ATFONT.DLL     CAB1.BMP
ACCESS00.GRP     AUTO-BU.REC    CACHEDMP.CCH
AD-DOS.COM       BOXES.BMP      CALC.EXE
AD_PREFS.INI     BU24B&W.BMP    CALC.HLP
ADMODULE.ADS     BUGS.BMP       CALENDAR.EXE

No files selected
 ..
 Data_base_file
 development.w
 ftpdir
 images_old
 mail_news
.login                    15  Feb 10 1992
get.tst                32768  Sep 26 1991
invoices_91.current   950464  Sep 14 1991
jump.txt                 103  Apr 21 1991
mail_incoming.June      6232  Feb  9 1991
mbox                    7356  Jan 31 1992
new_clients.Jan92      39342  Jan 14 1992
```

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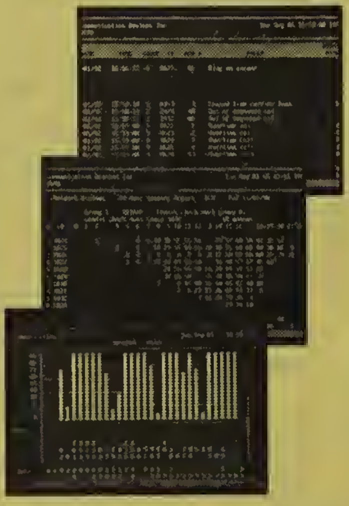

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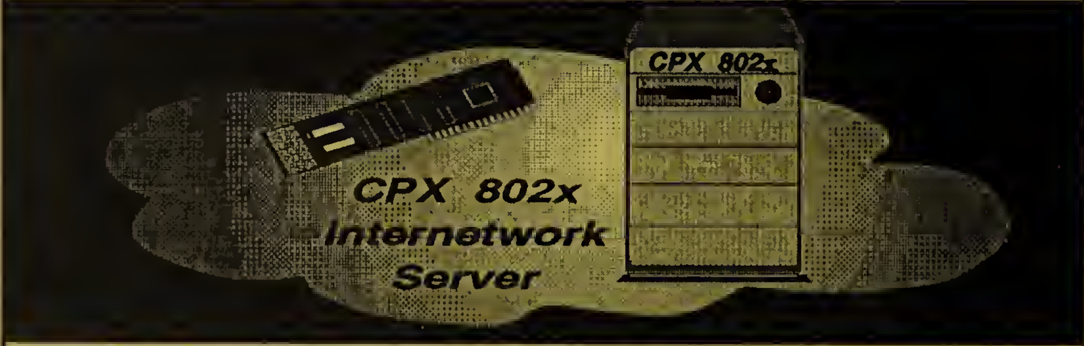

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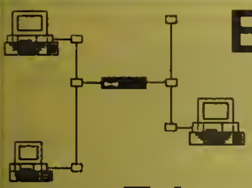

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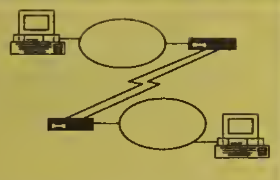

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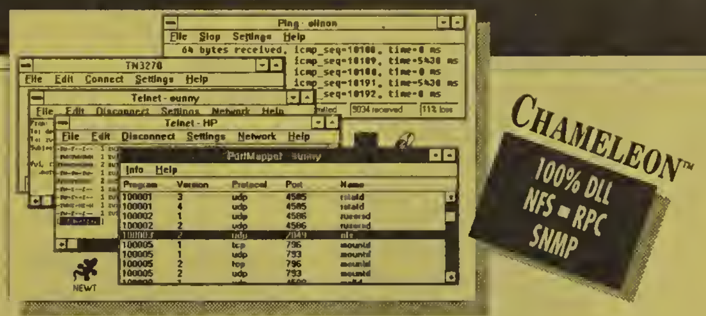

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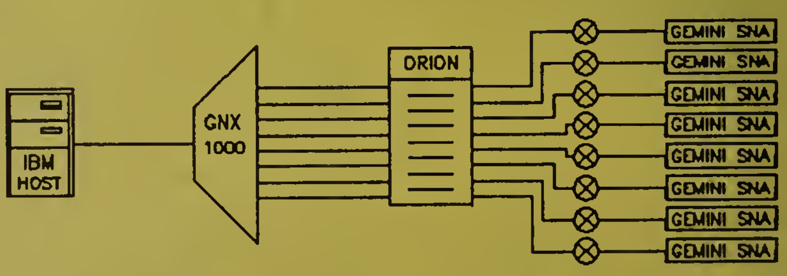

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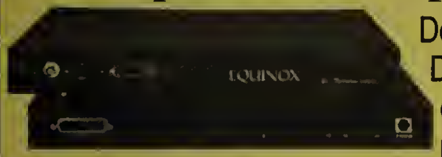

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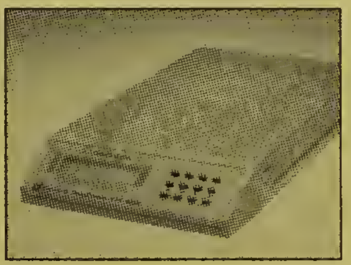

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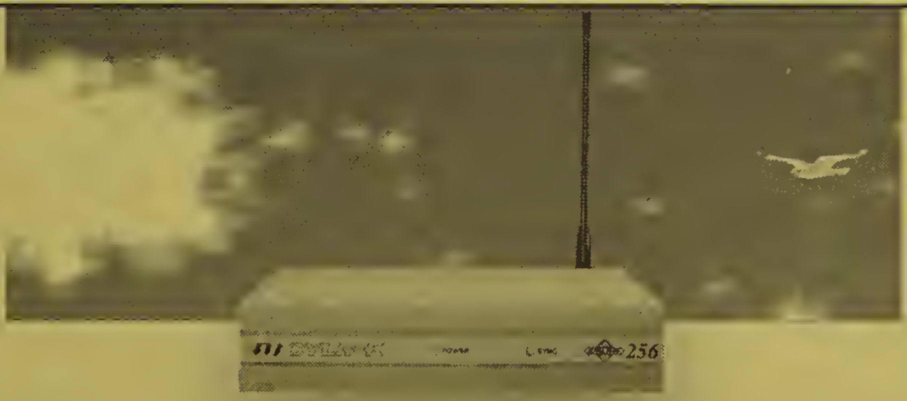

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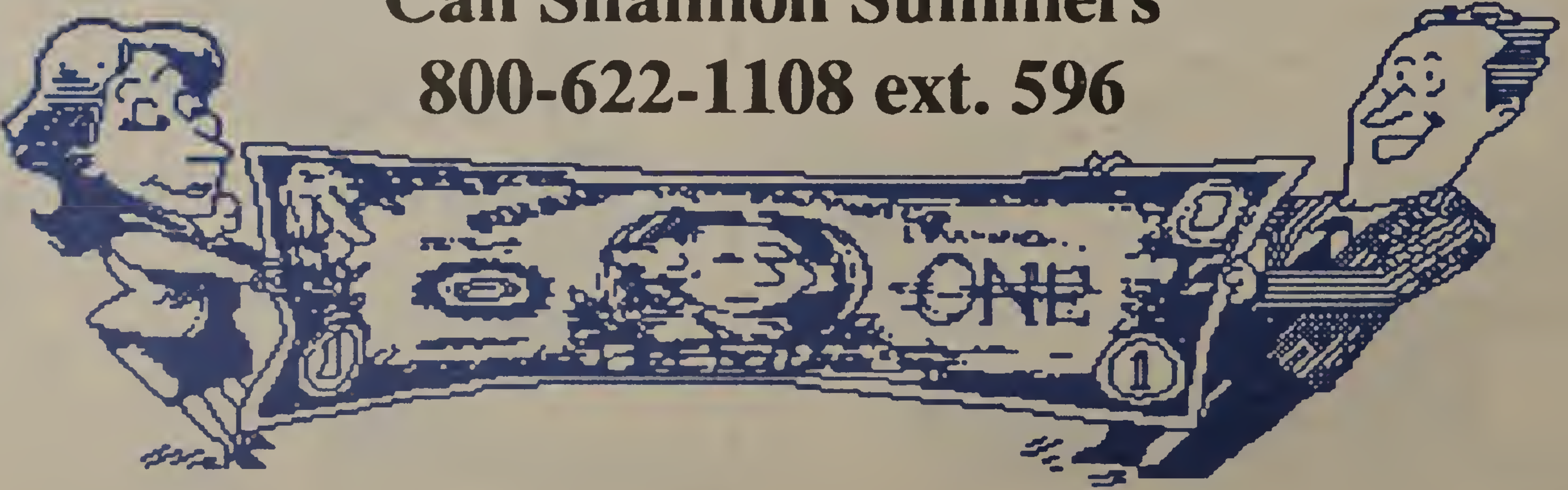

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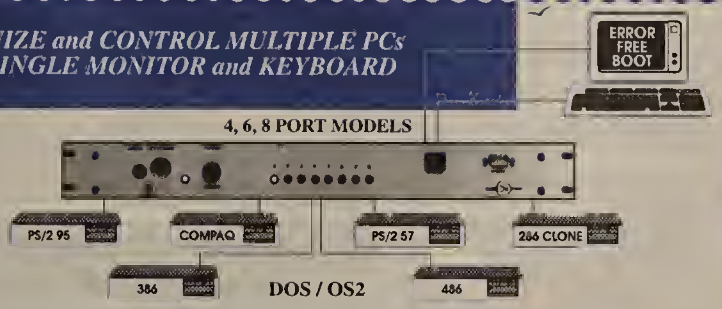

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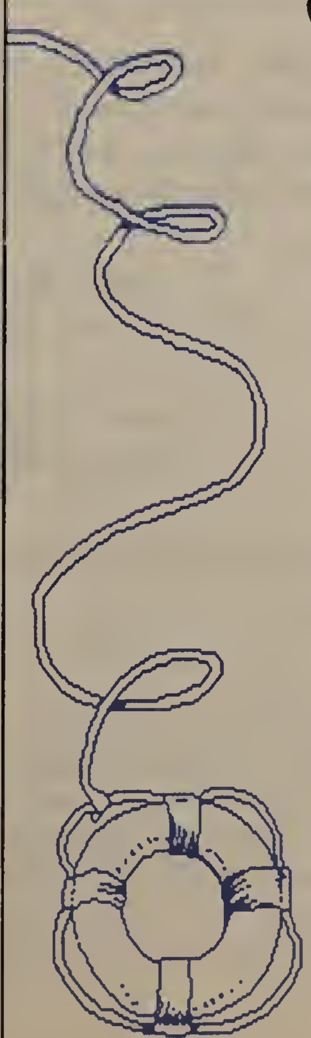

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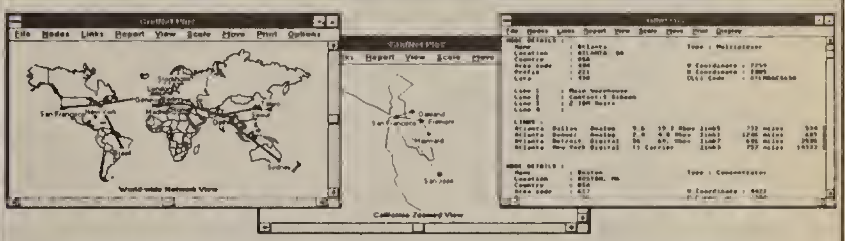

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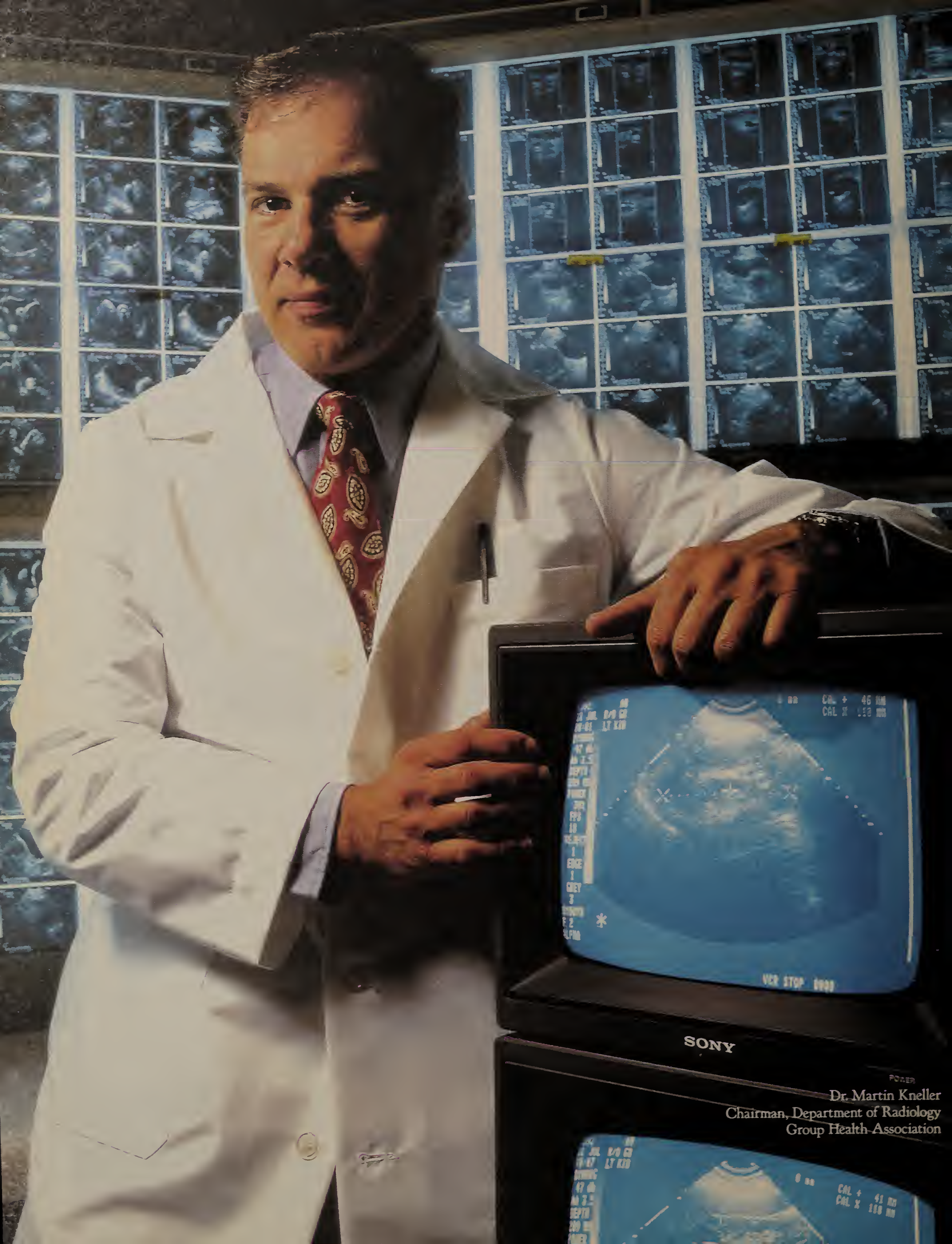

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Oracle plots to conquer new worlds

continued from page 1

costs will enable the development of new server-based applications that will change people's access to information on both an enterprise and a personal level," Ellison said. "These new applications will change the way people work and live."

Most of the plans laid out by Ellison call for using all or portions of Oracle's Version 7 database or its accompanying communications software to provide flexible and reliable data handling, manipulation and storage for a wide range of new applications, such as the upcoming work group computing product.

He envisions the Oracle database evolving into "a single, universal information repository" that can store tabular relational data, structured object data, integrated, real-time audio and video streams and rapid indexing of text and images.

Bundling technology

Ellison said that during the next few months a number of hardware and software vendors will announce plans to bundle Oracle technology into their products. He declined to offer details but mentioned a pending deal with a large telecommunications company.

Sources close to the company speculate that Oracle will be providing its database software integrated with a customized or enhanced Oracle mail solution as the basis for a public mail system serving as many as one million users.

Oracle's plan to support other data types with its next version of its database means the company could be well on its way to developing applications in advanced personal communications and data publishing with partners in the growing multimedia/communications field.

For example, Ellison said that because Oracle's software could search 32G bytes of data in half a second, it would be possible to create personalized electronic daily newspapers with information gleaned from news sources around the world.

Oracle has long been interested in the wireless arena, where mobile users linked by wide-area services would access vast public information repositories managed — of course — by Oracle's database technology.

"We have a vision to be the data server company for a new market — one that redefines the access, use, communication and storage of all different types of data," said Marc Benioff, corporate vice president of the New Technology Division. "To do this, we need the leaders in the telecommunications industry."

Notes-like product

In addition, Ellison said, Oracle will move into the collaborative computing market this summer with a Lotus Development Corp. Notes-like product.

Tenatively dubbed Oracle Office, Ellison said the product will blend existing technologies into "a text-oriented database with integrated messaging and replication."

> Ellison envisions the Oracle database evolving into "a single, universal information repository."
>
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Ellison added that during the next few months Oracle will unveil a new set of development tools that will for the first time support other database environments. Included will be completely reworked versions of existing tools as well as new tools that will allow the development of multimedia applications.

Oracle's leader said his company was in discussions with "a significant low-end partner" that could call for Oracle technology to be bundled with its operating system.

While he would not elaborate, he said the partnership and new products would provide not only new business opportunities but challenge Microsoft Corp.'s growing dominance of the software market. Microsoft is facing a number of new challenges, including Novell, Inc.'s recent acquisition of AT&T's Unix System Laboratories, Inc. — a move Ellison applauded.

"This industry needs to think about an alternative to Microsoft," he said. "The Unix market has been so fragmented, perhaps Novell can provide the leadership necessary to have some consistency there."

Ironically, Ellison said Oracle is putting a much greater emphasis on Windows applications because that is where the desktop market is going right now.

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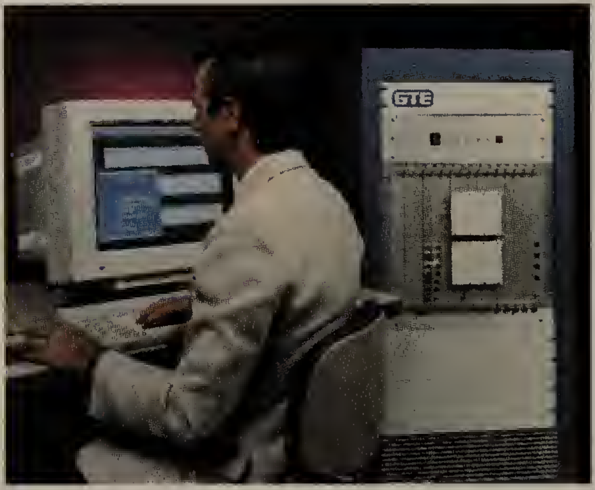

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Circle Reader Service #6

Firm decommissions SNA infrastructure

continued from page 1

operations, systems and administration for PaineWebber.

PaineWebber has already begun revamping its 280 nationwide branches. It expects to have most of them finished by the middle of this year and the entire effort completed in two years.

Each branch will have an IBM 16M bit/sec Token-Ring Network running Novell, Inc.'s NetWare operating system. The LANs will allow brokers to share Quotron Systems, Inc. investment data and applications, such as various trading systems, that were rewritten to run on IBM RISC System/6000 and Sun Microsystems, Inc. SPARCstation servers.

The trading system applications currently run on an IBM mainframe at the data center. When the applications are rewritten for the LAN servers, the mainframe will serve as a central corporate data repository and as a processor of back-office administrative applications.

"The mainframe is essentially just another server on the network," said Robert McKinney, executive vice president and chief information officer at PaineWebber. "It's critical we use TCP/IP because we're going to have applications running on the mainframe and running in servers all over the firm, and we want them to be able to talk to each other."

The investment firm is also looking to contain communications costs as it speeds timely financial data through the net. That's where frame relay fits in.

"We wanted to move toward frame relay because it's going to give us port and bandwidth consolidation that is greater than what we're achieving today in our [time-division multiplexer network]," said Thomas Randall, corporate vice president of communications at PaineWebber.

The frame relay net will connect PaineWebber's branch offices to one another and to IBM mainframes in the firm's data center here. It will carry Transmission Control Protocol/Internet Protocol and SNA traffic, the latter encapsulated in IP by the Cisco routers.

A router at each branch will package data into frame relay frames and ship them via a 64K bit/sec link to an attached AT&T Paradyne Acculink 742 mux. The mux, which also supports voice traffic, will be linked via a T-1 line to a regional NET FRX node, which in turn is connected to the data center over multiple T-1 frame relay links.

One of the cost-containment features of the FRX network is its ability to allow PaineWebber to burst data above each branch's permanent virtual circuit committed information rate of 32K bit/sec, provided the bandwidth is available, Randall said.

To avoid network congestion, the FRX monitors its buffer space and frames queued for transmission. When congestion occurs, the FRX turns on Forward Explicit Congestion Notification or Backward Explicit Congestion Notification bits, which alert attached devices to slow their transmissions.

Frame relay will also help position PaineWebber for future higher speed packet- and cell-based technologies, such as Asynchronous Transfer Mode.

"We want to start becoming familiar with frame relay as a technology to understand where we go from here, whether it be in the private or public environment," Randall said. ◼

AT&T to announce ATM service rollout

continued from page 4

Inc., a New York brokerage firm — and also an ATM Forum member — operates a private ATM net and wants to learn more about AT&T's plans. "We're pleased to hear that AT&T's [detailing] ATM service [plans], but there are many questions that need to be answered," said Jeff Marshall, managing director of communications for Bear, Stearns. "We need deployment, availability and pricing information."

Analysts said service deployment will play a major role in users' decision whether to use the offering. "If AT&T comes out and says it's only going to offer the service in three or four major cities, you probably won't see users swarm to it," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "But if they make ATM available in a good number of cities, [the service] could take off."

Analysts said they would be surprised if AT&T detailed pricing for an ATM service at the conference here. "I think they've got a little work to do before they start talking pricing," said Steve Taylor, president of Distributed Networking Associates, a Greensboro, N.C., consultancy. ◼

Staff Writer Skip MacAskill contributed to this story.

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MCI will overhaul service

continued from page 1

frame relay pricing options. Previously, users had fixed-rate options with or without guaranteed bandwidth, known as a committed information rate (CIR). MCI will also lower its port charges by about 30%.

All of these changes, which will take effect in early March, are geared toward making MCI's frame relay service more economical, Weichselbaum said. The restructuring will also make frame relay pricing look more like private-line pricing. MCI is hoping the changes will give users, particularly AT&T private-line customers, an incentive to switch to frame relay, he said.

"Customers have told us that one of the biggest hurdles they've had with frame relay is a lack of compelling economics," he said. "When they've priced frame relay services against existing private-line services, many times it's not only not a savings, it actually costs more with frame relay."

He estimated that with the new pricing options and reduced port charges, frame relay would cost users about 20% to 70% less than the equivalent private-line net, including access charges. Before, only about 10% of private-line users would have found frame relay more economical.

Rick Malone, a principal with Vertical Systems Group, a Dedham, Mass., consultancy, agreed MCI's new pricing could mean significant savings. Based on advance information, he said the new pricing scheme and reduced port charges would make MCI's frame relay service reasonable.

One thing that kept users away was high port charges, which served as a hurdle to users that only wanted to switch a small amount of traffic onto frame relay. MCI's new monthly prices for ports range from $180 for a 56K/64K bit/sec port to $1,600 for a 1.3M/1.5M bit/sec port. In addition, users pay a onetime installation fee of $300 per port. Pricing for permanent virtual circuits will now be offered under three options: a fixed-rate option with a guaranteed CIR and distance-sensitive monthly charges; a usage-sensitive option with a guaranteed CIR, mileage-sensitive charges and a per-megabyte charge; and a usage-based option with no guaranteed CIR.

The second option gives users the guaranteed bandwidth expected from private lines but allows them to obtain savings by paying only for the capacity they use, Weichselbaum said. A typical private line is used only 12% of the time, he noted. With the new pricing option, users have bandwidth on demand but do not have to pay for dead time on the circuit.

Under this pricing option, a user subscribes to a CIR and pays a usage rate based on the CIR level and mileage. For transmissions exceeding the CIR, the charge is 10% of the prescribed CIR usage rate. A monthly minimum fee, 30% of MCI's fixed CIR rates, is also charged.

To protect customers from running up charges much higher than expected under the traditional fixed-rate pricing, MCI will cap usage charges at 120% of the fixed CIR monthly rate. ◪

HyperStream Frame Relay rate options

Fixed-rate option						
Committed information rate (CIR)	Monthly simplex rates					
	Mileage range					
	0-249	250-499	500-749	750-999	1,000-1,999	2,000+
16	$46	$57	$67	$78	$105	$132
64	$84	$103	$122	$141	$179	$217
256	$280	$343	$407	$470	$597	$724
512	$552	$680	$808	$935	$1,191	$1,446
768	$833	$1,030	$1,227	$1,423	$1,817	$2,210
1,024	$1,099	$1,377	$1,655	$1,933	$2,489	$3,044
Usage CIR option (per-megabyte simplex usage rate)						
	0-249	250-499	500-749	750-999	1,000-1,999	2,000+
CIR usage	$0.0169	$.0208	$.0248	$.0350	$.0444	$.0600
Non-CIR usage	10% of CIR usage rate					
Monthly minimum	30% of corresponding fixed CIR monthly rate					
Usage cap	120% of corresponding fixed CIR monthly rate					
Zero CIR option (per-megabyte simplex usage rate)						
	0-249	250-499	500-749	750-999	1,000-1,999	2,000+
All usage	$.0084	$.0104	$.0124	$.0175	$.0222	$.0300
Monthly minimum	$5.00	$6.00	$7.00	$10.00	$13.00	$17.00

All prices are for permanent virtual circuits

SOURCE: MCI COMMUNICATIONS CORP.

ComNet to host PBX debuts

continued from page 2

busy-hour call completions, whereas the next largest Meridian 1 model, the Option 71, can only handle 32,000. The Option 81 and Option 71 can each be configured to support 10,000 ports.

Rick Moran, director of product marketing for the Meridian 1 line, said the company will over time replace the proprietary 16- and 24-bit processors in its smaller Meridian 1 models with the Motorola microprocessor.

Migration from an Option 71 to an 81 requires replacement of the older switch's common equipment module, which contains the processor, memory and links to adjunct systems. Moran said the cost of migrating would be $30,000 to $40,000, depending on the size of the system.

Northern Telecom will also introduce the Option 21E, an enhanced version of the Option 21. Moran said it will be easier to migrate from the 21E to the larger 51, 61 and 71 since all four switches use the same 24-bit microprocessor.

The Option 21E handles four times as many ports — 1,200 compared to the Option 21's 300 — is roughly three times faster and offers four times the memory of the older unit. It is targeted at users with 100 to 400 stations, Moran said.

Moving from an Option 21 to the new Option 21E requires swapping out four existing cards and a software upgrade to Northern Telecom's latest switch software — the X11 Release 18.

The vendor said the new models will be generally available in the second quarter but would not divulge pricing.

AT&T's low-end bid will come in the form of the Definity Generic 3 VS — a single-cabinet, wall-mountable PBX designed to support 40 to 60 stations. The VS uses the same microprocessor, an Intel Corp. 80386, used in the Generic S.

The VS supports many of the advanced networking features found in the larger Definity Generic models. AT&T said it will make a PBX announcement here but would neither confirm nor deny plans to roll out the VS. ◪

Departure may lead to new focus

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chief operating officer of Cabletron Systems, Inc. in Rochester, N.H., said IBM needs to change, but also must retain some of its strengths. "IBM's customer service is excellent," he said.

But whatever direction the new IBM leader takes, the network industry will continue to thrive. "The network industry is not dependent upon one company," he said.

One intriguing — though unlikely — possibility for an Akers replacement is Ellen Hancock, senior vice president for networking systems at IBM and the company's highest ranking woman executive. She has overseen IBM's integration of Systems Network Architecture with Transmission Control Protocol/Internet Protocol, introduction of the 6611 router and other projects.

"I like the idea," said Paul Johnson, vice president at The First Boston Co., a New York investment firm. "She understands networks are critically important." ◪

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Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

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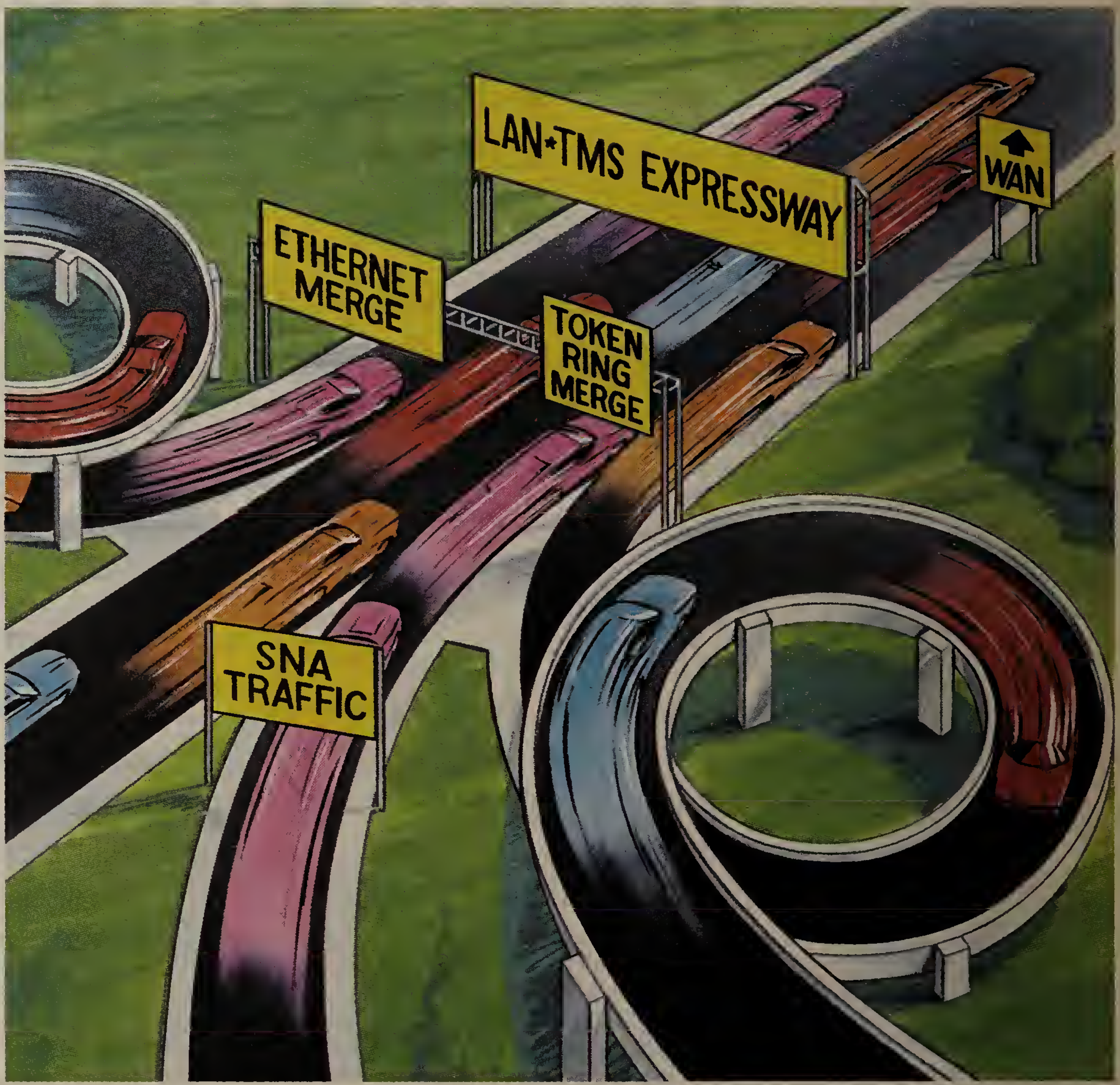

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